V69

Price One Shilling Net,
or 25 Cents.

November, 1911.

LIBRARY
U. S. Department of Agriculture.

THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

Editors for Great Britain and Ireland:—

FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,
FORMERLY PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON.

GEO. H. WOOLDRIDGE, F.R.C.V.S., M.R.I.A.,
PROFESSOR OF HYGIENE, MATERIA MEDICA AND THERAPEUTICS IN THE ROYAL VETERINARY COLLEGE, LONDON.

Editor for Australasia:—

J. A. GILRUTH, D.V.Sc., M.R.C.V.S., F.R.S.E.,
DEAN OF THE VETERINARY FACULTY, UNIVERSITY OF MELBOURNE, AUSTRALIA.

Annual Subscription for the British Empire, 12s. Post Free; for the United States, $3.00.

LONDON.
BAILLIÈRE, TINDALL & COX,
8, HENRIETTA STREET, COVENT GARDEN.

AUSTRALIA AND NEW ZEALAND.
Messrs. GORDON & GOTCH, Ltd.,
Melbourne, Sydney, Wellington, &c.

NEW YORK:
W. R. JENKINS,
851 and 853, Sixth Avenue.

CHICAGO:
ALEXANDER EGER,
132, West Lake Street.

Entered as Second-Class Matter in the U.S. Post.

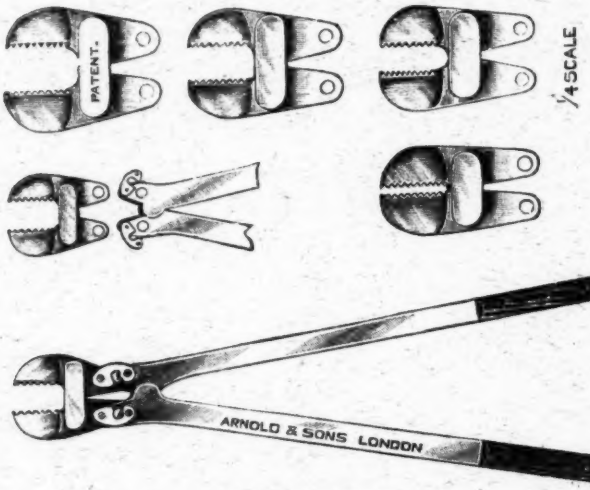
No. 437. Vol. 67.

"ARNOLD'S"

Patent Molar Tooth Cutter,

WITH REMOVABLE CUTTING BLADES
OF DIFFERENT WIDTHS.

The lightest, most powerful and reliable cutter ever brought before the notice of the profession.



PRICES.

With 1 Cutting Blade **£3 0 0**

Extra Blades, 17/6 each.

With 4 Cutting Blades of different widths ... **£5 12 6**

ARNOLD & SONS,

Veterinary Instrument Manufacturers,

GILTSPUR STREET, LONDON, E.C.

Telegraphic Address:
"INSTRUMENTS, LONDON."

Telephone Number:
City 5240 (3 lines).

CONTENTS.

PAGE

EDITORIALS—

The Practitioners' Desire for Additions to the Subjects of the Present Post-Graduate Courses... 641

The American Veterinary Medical Association 643

GENERAL ARTICLES—

Some Members of the Royal College of Veterinary Surgeons who have achieved National Distinction in Comparative Medicine in the United States of America. By Dr. ARTHUR HUGHES, Litt.M., Ph.D. (Cornell University), D.V.M. (New York State Veterinary College) 645

Septic Infection of the Lateral Cartilages of the Horse's Foot. By W. STAPLEY, M.D., M.R.C.V.S., D.V.Sc. 652

Some Notes on the Passage of Fluids through the Stomachs of Ruminants. By J. F. CRAIG, M.A., M.R.C.V.S. 655

An Infectious Foot Disease in Sheep. By Dr. A. THEILER, C.M.G. ... 659

Some *Post-mortem* Alterations of Meat. By J. B. BUXTON, M.R.C.V.S., D.V.H. 663

CLINICAL ARTICLES—

Strangles, complicated by Purpura Hæmorrhagica, treated with Strangline. By Captain A. J. WILLIAMS, F.R.C.V.S., A.V.C. 674

Two Cases of Paraplegia. By Captain A. J. WILLIAMS, F.R.C.V.S., A.V.C. 676

Castration of a Double Rig. By J. J. O'CONNOR, M.R.C.V.S. 677

Thrombosis of the Iliac Arteries. By J. J. O'CONNOR, M.R.C.V.S. 678

Rupture of the Colon in a Horse. By J. J. O'CONNOR, M.R.C.V.S. 679

Sinus in the Axilla of a Polo Pony. By J. J. O'CONNOR, M.R.C.V.S. ... 680

Abnormal Quantity of Fat in the Temporal Fossa of a Horse. By J. J. O'CONNOR, M.R.C.V.S. 681

Notes on some useful Surgical Instruments. By E. WALLIS HOARE, F.R.C.V.S. 682

(*Continued on p. xi.*)

JAMES SWIFT & SON,

OPTICAL AND SCIENTIFIC INSTRUMENT MAKERS,

Contractors to all Scientific Departments of H.M. Government.

Grands Prix, Diplomas of Honour, and Gold Medals at London, Paris, Brussels, &c.

NEW "I.M.S." MICROSCOPE

(As supplied to the Army Veterinary Department, War Office).

Specially designed for Bacteriology and Hæmatology.

Fitted with $\frac{2}{3}$ in., $\frac{1}{6}$ in., and $\frac{1}{12}$ in. (Oil Immersion) Objectives, Oculars, Triple Dust-proof Nosepiece, Abbe Condenser, Iris Diaphragm, Special Mechanical Stage, &c., in Cabinet, **£23.**

Catalogue gratis on application.

UNIVERSITY OPTICAL WORKS,

81, TOTTENHAM COURT ROAD, LONDON, W.

TRADE MARK.

SUPPLIED ONLY TO THE PROFESSION.

TUBERCULIN and MALLEIN.

In Hermetically-sealed Ampoules, containing about 4 cc., 9d. each.

Veterinary Tetanus Antitoxin ... ... 10 cc. 2/6; Dry form 3/-
Anti-Streptococcus Polyvalent Serum ... 10 cc. 2/6; Dry form 3/-
Canine Distemper ... ... 4 cc. 2/6

PASTEUR VACCINE CO.'S TUBERCULIN for Diagnosis of Tuberculosis,
PASTEUR VACCINE CO.'S MALLEIN for Diagnosis of Glanders,
ARE INSISTED UPON BY
Foreign and Colonial Governments importing BRITISH STOCK.

275,000 doses sold.

"BLACKLEGINE."

CORD FORM OF BLACKLEG VACCINE.

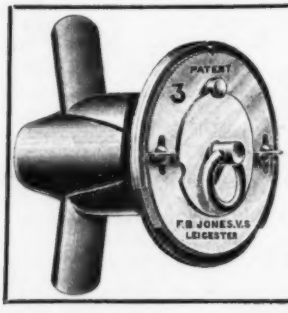
Single, 10 doses, 6/-; 20, 10/-; 50, 24/-.
Double, 10 doses, 8/-. Needle Outfit, 2/6; Ditto with Forceps, 3/-.

275,000 doses sold.

275,000 doses have been sold in the United Kingdom. The Easiest Method of Inoculation, and always ready for use.
We also furnish Anthrax and Blackleg Vaccine (powder form); Rat Virus, White Scour Serum, &c.

Sole British Agents:—
C. H. HUISH & Co., 12, Red Lion Square, London, W.C.
Telephone—4639 Central. Telegrams—PROSUM, LONDON.

AGENTS required in unrepresented districts for the **Imperial Accident Insurance Co., Ltd.** Est. 1878. Horses Insured against Death from Accident or Disease, Mares for Foaling and Loss of Foals; Farmers' Liability for Accidents to Labourers, Servants, and Workmen's Compensation. Claims paid £500,000. Address Agency Manager, 17, Pall Mall East, London, S.W.



THE GENUINE
"JONES"
TRACHEOTOMY TUBES
Still the Simplest and Best for
Material, Workmanship and Design.
Price List Free.
Miss JONES,
Aberbraint, 86, Kimberley Road, LEICESTER.
(*Successor to F. B. Jones, M.R.C.V.S.L., deceased.*)

CONTENTS—*continued.*

PAGE

CANINE CLINICAL NOTES—

A Divided Spleen. By O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S. 688

Chronic Bursitis in Irish Wolfhound. By J. J. O'CONNOR, M.R.C.V.S. ... 690

Fistula Through the Radius of a Red Setter. By J. J. O'CONNOR, M.R.C.V.S. 691

REPORTS—

Veterinary Post-Graduate Study. By J. STEWART STOCKMAN, M.R.C.V.S. 692

The American Veterinary Medical Association 698

TRANSLATIONS—

The Subcutaneous Injection of Oil of Turpentine and its Employment as a Revulsive. By Professor FRICK 703

Filariasis of the Flexor Tendons. By PAUL DUDZUS 703

LETTERS AND COMMUNICATIONS, &c. 704

BOOKS AND PERIODICALS. &c., RECEIVED 704

Just Published.] **[Second Edition.**

Pp. viii. + 372. Price **5/-** net.

Physiological Principles in Treatment,

By W. LANGDON BROWN,

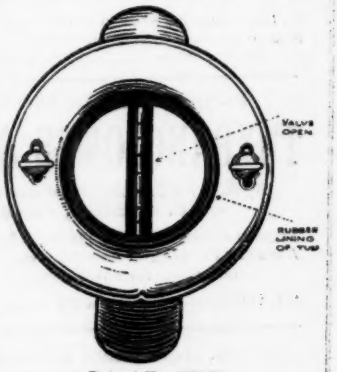
M.A., M.D. (CANTAB.), F.R.C.P. (LOND.)

Physician to the Metropolitan Hospital; Medical Registrar and Demonstrator of Physiology, St. Bartholomew's Hospital.

London: BAILLIERE, TINDALL & COX,
8, Henrietta Street, Covent Garden.

GIBSON'S

Patent Tracheotomy Tubes.



Patent No. 3528/07.

Also Improved Open Tubes for Race Horses.

Reduction of 20 per cent. in the price.

Send for Particulars and Testimonials to

G. E. GIBSON, OAKHAM.

Bailliere, Tindall & Cox's

IMPORTANT PUBLICATIONS.

Recently published. Royal 8vo. Pp. xii. + 350, with 4 coloured Plates and 125 Illustrations. Price 15s. net (postage 5d. extra).

PROTOZOÖLOGY

By GARY. N. CALKINS, Ph.D.,

Professor of Protozoölogy in Columbia University, New York.

CONTENTS.—Chapters I.—General Organization of the Protozoa. II.—Physiological Activities of the Protozoa. III.—Protoplasmic Age of Protozoa. IV. — Conjugation, Maturation and Fertilization. V. — Parasitism. VI., VII. & VIII.—The Pathogenic Flagellates. IX.—The Pathogenic Homosporidia. X.—The Pathogenic Rhizopoda.

Now Ready. Demy 8vo. Pp. xii. + 644. With 14 coloured Plates and 214 other illustrations. Price 21s. net.

A TEXT-BOOK ON DISEASE-PRODUCING

MICROÖRGANISMS

For the use of Veterinary Students and Practitioners.

By MAXIMILIAN HERZOG, M.D.

Professor of Pathology and Bacteriology in the Chicago Veterinary College; Pathologist to the German and the Alexian Brothers' Hospitals of Chicago; late Pathologist in the Bureau of Science, Manila, P. I., &c.

As there does not exist in the English language any other text-book on Pathogenic Microörganisms written especially for the use of veterinary students and practitioners, this work should be welcomed by those for whom it is intended.

Pp. 538, with coloured Plate and 81 Illustrations. Price 21s. net.

TRYPANOSOMES & TRYPANOSOMIASES

By A. LAVERAN, *Membre de l'Institut et de l'Académie de Medecine;* and F. MESNIL, *Chef de Laboratoire à l'Institut Pasteur.*

Translated and edited by DAVID NABARRO, M.D., B.Sc., D.P.H. Lond. Assistant Professor of Pathology and Bacteriology, University College, London; late Royal Society Commissioner on Sleeping Sickness in Uganda.

"It is the only complete work on the subject."—*Veterinary Journal.*

Pp. xxviii. + 1252, with 14 Coloured Plates and 373 Illustrations, mostly original. Price 21s. net.

CASTELLANI & CHALMERS' TROPICAL MEDICINE.

"We can confidently recommend it to all who are interested in tropical diseases as being the most comprehensive and up-to-date manual in English upon the subject."—*Medical Press and Circular.*

BAILLIERE, TINDALL & COX, 8, Henrietta Street, Covent Garden, W.C.

THE

VETERINARY JOURNAL

NOVEMBER, 1911.

Editorials.

THE PRACTITIONERS' DESIRE FOR ADDITIONS TO THE SUBJECTS OF THE PRESENT POST-GRADUATE COURSES.

POST-GRADUATE study was the predominant note throughout the excellent inaugural address delivered by Mr. Stockman at the opening of the session at the Camden Town School, and which appears elsewhere in this issue. The realization by the veterinary profession of this country of the necessity for such study has been a very pleasing feature in recent years, and the way in which advantage has been taken of the institution of special post-graduate courses of instruction speaks for itself. That such courses serve a most useful purpose must be admitted at once. They afford a means of obtaining a considerable amount of advanced special knowledge in a limited time, a matter of vital importance to men engaged in private practice and holding local inspectorships. Obviously such men cannot possibly afford to leave their practices for long periods of time, and needs must take advantage of what has been referred to sometimes, in more or less sarcastic vein, as "spoon food." But it was not so much to this conventional course of post-graduate study that Mr. Stockman wished to draw attention "as to that kind of

education a man may seek out for himself and to a certain extent direct." There can be no doubt that this is the best line of study, but, heretofore, time and expense have stood in the way of more than a few who would have made excellent investigators. It would seem, however, that new opportunities are being offered to our younger graduates now in the form of scholarships of the value of £150 a year for three years so that they may train as investigators. We earnestly trust that full advantage will be taken of this offer of the Board of Agriculture, and we are hopeful that much good will come of it.

In the past, post-graduate study of the independent and self-directed type has, as a rule, been well rewarded, and numerous examples could be quoted. We will not do more, however, than to point out those whose names are mentioned in that excellent series of articles, the first of which, from the facile pen of Dr. Arthur Hughes, we published in our last issue and continue in this, concerning "Members of the Royal College of Veterinary Surgeons who have achieved distinction in the United States of America." Such men as Law, Dalrymple, Joseph Hughes, Hassall, Peters, and Liautard have made veterinary history, solely, in the first place, as the result of well-directed and self-guided post-graduate study. Our younger men now have facilities offered to them such as those men never dreamed of; and with those facilities, of course, are responsibilities, for on them the future of the veterinary profession depends. Let them see to it that the opportunities are not missed.

In reference to the fixed courses of post-graduate instruction, as provided at various institutions, it is certainly strange that they are all limited to pathology, bacteriology, protozoology, and to sanitary science. We consider it strange, because by far the largest number of veterinary surgeons are engaged in general practice, and yet no effort appears to have been made to provide a post-graduate course of instruction for them in the numerous recent advances in surgical and medical practice. We feel certain that if such a course were instituted it would be taken advantage of to the fullest extent. Striking evidence on this point is afforded by the increased attendance at meetings of veterinary societies when any surgical demonstration is to be given. Even though it often happens that most of the people attending can only see in a very imperfect manner what is being done, yet their

keenness to see that little and to ask questions and learn about it is striking testimony in support of our view. Then why do not the colleges provide it? It would be a financial success to them, and numerous practitioners would hail such additional subjects with delight.

THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

THAT the veterinary profession in America is very active and making very rapid strides is the impression that all will hold after reading the brief report of the meeting of the above Association, on pages 698 *et seq.* The papers were very varied and numerous, and together contain an enormous amount of valuable information.

The Presidential Address of Mr. George Glover was very significant of progress and deep thought on behalf of his professional brethren. That America should welcome with open arms the graduates of foreign schools, whilst the American diploma was not recognized as a licence to practise in European countries, was a condition of affairs which he emphasized as one which should not exist, and he used it as a strong plea for a higher and uniform matriculation standard and a more uniform and prolonged college course. The multiplicity of graduation titles, too, was touched upon, as in America one finds that, instead of the uniform M.R.C.V.S. which we use in England, and which is the useful outcome of our one portal system, the American veterinarian has the selection of V.S., M.D.V., D.V.M., B.V.Sc., and others, which each indicate, to those who know the signification, the school from which the licence to practise has been issued.

The one portal system would be impossible in America on account of the long distances over which any one body of examiners would have to travel, but some attempt at uniformity in the title or qualification issued might be possible, if one could but overcome the pride which is naturally felt by each individual college in the title it has created, and the prestige of which it has maintained for so many years. That as far as was possible

a higher entrance educational standard should be adopted, and that this at least should be uniform, was particularly dwelt upon by Mr. Glover, and in this he had the hearty support of the Association.

It would be well to explain here that the American Veterinary Medical Association, consisting as it does of more than 1,500 members, and including all the most earnest workers and well-wishers of the veterinary profession in the United States and Canada, has done, and is doing, an immense amount of good. By refusing to accept as members the graduates of certain lower-grade so-called colleges, by the resolutions it has sent up from time to time to various Government and local authorities, by the pressure it has brought to bear in many ways, and by arranging for papers, discussions, and practical demonstrations on up-to-date subjects, the Association has become a power in the land, and its membership is valued very highly. It caters for every branch of the profession, and in devoting the whole of the last day to demonstrations and operations which are of interest and value to the general practitioner, our National Veterinary Association might well take a leaf out of its book.

General Articles.

SOME MEMBERS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS WHO HAVE ACHIEVED NATIONAL DISTINCTION IN COMPARATIVE MEDICINE IN THE UNITED STATES OF AMERICA.

By Dr. ARTHUR HUGHES, Litt.M., Ph.D. (Cornell University), D.V.M. (New York State Veterinary College),

II.—William Haddock Dalrymple, M.R.C.V.S.

(*Continued from page* 591.)

Mr. Dalrymple has been Secretary of Louisiana State Agricultural Society and Louisiana Stock Breeders' Association since 1897; President United States Experiment Station Veterinary Association, 1898-1899; President of the American Veterinary Medical Association, 1907-1908; member of the Executive Committee National Live Stock Association, 1902; member of Louisiana State Live Stock Sanitary Board, 1910; President Louisiana State Veterinary Medical Association, 1910; President National Live Stock Sanitary Association. In 1905 his name was one of five submitted by the American Veterinary Medical Association to be voted on for Chief of the Bureau of Animal Industry, U.S. Department of Agriculture. Twice he has been offered important permanent official positions, once as Head of the Veterinary Division of Iowa State Agricultural College; again to be Chief Veterinarian of the Philippine Islands, both of which positions he refused. He was made a member of the Advisory Board of the United States Agricultural and Industrial Exposition Committee, 1910; member of the Royal Institute of Public Health, London; of the International Congress on Tuberculosis, 1908; American Public Health Association; honorary member of the Louisiana Naturalists' Club; member of the American Association for the Advancement of Science, 1910; member of the Authors' Club, London, 1910. He was elected a member of the Royal Society of Arts, London, 1911.

A tabulation of the subjects of the articles which Professor Dalrymple has written would itself fill a large-sized pamphlet, and they have been written for numerous magazines. Many of

them have been printed speeches; many more have been special articles on a wide range of subjects, from pamphlets on agricultural topics in popular speech to elaborate scientific articles for the veterinary or medical Press. We may illustrate this by reference to some of his most recent writings. We find him lately chief commencement speaker at the Kansas City Veterinary College, 1911, at which he makes an address replete with wisdom and fraternal advice; writing an article on the depletion of cattle caused by ticks and its relation to milk secretion, for the *Quarterly Bulletin* of the Louisiana State Board of Health; assisting by advice in the publication of the biennial report of the Louisiana State Live Stock Sanitary Board; assisting the great railroads to bring agricultural settlers to the Southern States by writing descriptive articles for them; inditing articles one after the other for *The Breeders' Gazette* (a great live stock journal) on agricultural conditions and live stock matters; successfully forming a league among farmers in Louisiana to exterminate ticks on cattle causing redwater; publishing an article for *The Gulf States Farmer* on live stock interests in the Southern States; devising and publishing pictorial material as a "tuberculosis demonstration" with the object of illustrating the danger of bovine tuberculosis to man. These, too, are only a few of Dalrymple's activities within 1910-1911.

From these remarks it is easy to see that such a worker must have achieved national distinction in his field of labour. Dalrymple has that clear vision in his sphere of activity which has enabled him to successfully start movements for the good of the whole profession. He has always been the organizer, the leader, the man who is willing to take on his shoulders the burden of work; to take the initiative in things; to whip matters into shape so that success will follow the effort; to prompt others how work may properly be done, then to step aside and let the work, well started and organized, go on. This form of potency is recognized in the offices for which he has been chosen, and which he has so successfully filled. These have been local offices in Baton Rouge, State offices in Louisiana, city scientific offices in New Orleans, and chief executive office in national live stock and veterinary bodies. In each the wakefulness of his intellect has given him the insight into present and future needs, and to discern possible lines of progress in each.

There are other means which have enabled him to do these things. He is a man of engaging personality who strikes those he meets as a man in whom confidence should be placed. His appearance is of a kind to make one think that his natural bent is to be a "master of assemblies." He has calmness of nature which makes him at home as an executive officer, to which is added hard Scotch sense and habitual serenity. His literary gift is omnipresent. He has the power to marshal hurriedly, at a sitting or two, just the facts, in just such an order, and with just such sparkle as will make them presentable to an audience. His speeches are always shot through with good sense. He has a great knack of pamphleteering, and his pamphlets are sure to hit the mark. His university position he has filled more than acceptably. But he has struck out from mere routine. Before agricultural, medical, veterinary, or other bodies he is equally at home. If we may be permitted to use a colloquialism, the veterinarian does not "stick out on him"—he is not a blatant veterinarian. No one thinks of him as primarily and exclusively the veterinarian. Veterinary science is to him a tool for the advancement of the public interests.

III.—Joseph Hughes, M.R.C.V.S.

On May 20, 1859, on a farm near Dundalk, County Louth, Ireland, Joseph Hughes was born. With a touch of Hibernian humour he tells the story that Dundalk is called the "Gap of the North," as it is just between the formidable orange and green sections—a peaceful region where no violent passions blaze. His early training was obtained in the National School of Dundalk. Between 1870-1875 he was at the Christian Brothers School; then for two years at St. Mary's College, all near his home. He then took up farming with his father and brother. Many will remember that those years (1878-1879) were the wettest possible. Everything rotted. The Hughes's little farm stock was steadily beset by a variety of diseases. During that period the farms of the region were quarantined for contagious pleuro-pneumonia and foot-and-mouth disease. Between 1877-1879 the liver fluke, *Distoma hepaticum*, which was then a new parasitism for the region, decimated the sheep of the Hughes' farm. This series of disasters, especially among live stock

at the time, first engendered in Joseph Hughes's mind the ambition to take up a veterinary course.

Consequently, after consultation with the local Dundalk veterinarian, Thomas Drummond, M.R.C.V.S., a Scotch graduate, Hughes went to Glasgow Veterinary College, September, 1879. In the spring of 1882 he received the M.R.C.V.S. The story goes that a number of veterinary students at Glasgow, in the winter of 1881-1882, had gathered together in the rooms of one of them, when the question arose what each was to do after he left college. The question went around the circle till it came to Joseph Hughes. He answered: "I'm going to Chicago to start a veterinary school." Job Johnson, M.R.C.V.S., a junior student at Glasgow at the time, tells the story and vouches for it.

At any rate, in September, 1882, Joseph Hughes left the old country and went direct to Chicago. He did not know a soul in the city, but bore letters of introduction from a few friends he had met *en route* to America. He soon made his way into prominence among the professional men of the city. In the winter of 1882-1883 he divulged his plan to start a veterinary school to Dr. R. J. Withers, a man trained in the English Agricultural School at Cirencester, Glos., and who, having engrafted upon his agricultural knowledge a knowledge of medicine, and having a knack for treating animals, had made a success of veterinary practice. In May, 1883, the prospective school in tangible form was started, with Dr. R. J. Withers as president, Dr. A. H. Baker, a graduate of McGill University, Montreal, as treasurer, and Joseph Hughes as secretary. Dr. Withers was associated with these men in the conduct of this, the Chicago Veterinary College, from 1883 to 1894, when, because of ill-health, Dr. Withers was obliged to relinquish his work, though he did not sever his connection with the school under the charter. He died, I think, in 1903. In 1905 a new charter was granted to the college by the State of Illinois, when Joseph Hughes became president, A. H. Baker retained the office of treasurer, and E. J. McArdle, a brilliant Chicago lawyer, also a Dundalk man, became secretary. These are the directors to-day.

From its inception in 1883 to the present no veterinary college in the United States has been blessed with greater success than the Chicago Veterinary College. The private practitioners

who have graduated from it number several thousands, and they are distributed by scores and hundreds in forty-three of the States of the United States, in five of the provinces of the Dominion of Canada, and in the countries of Latin South America, in which places many of them are eminently successful in all forms of private veterinary practice. It has several hundred men in the United States Government Veterinary Service, and the chief of that service at Washington, Dr. A. D. Melvin, is a Chicago Veterinary College man. The graduates of that school are successful in the United States Army, as State veterinarians, as city veterinarians, as college professors. Its honour roll in these respects is a very large one.

Joseph Hughes, besides being President of the College, is Professor of Veterinary Anatomy, special and comparative, lameness, shoeing, and examination of horses for unsoundness. In the extended period of his connection with the school he has written many articles for *The Breeders' Gazette*, the celebrated American live stock journal, *The Chicago Horseman*, *The Farmers' Review*, and *The National Live Stock Journal*, which was the predecessor of *The Breeders' Gazette*, as well as published numerous papers which he had previously read before associations and societies. He has done much for the organization of State and national associations. From 1884-1887 (five years) he was secretary of the Illinois State Veterinary Medical Association, and later president of that association and of the Chicago Veterinary Association. He frequently has had to do with the stamping out of contagious diseases in the State of Illinois. The Illinois State University chose him as Professor of Veterinary Science, but he refused the office. He was a vice-president of the Veterinary Section of the International Congress on Tuberculosis, Washington, 1908; chairman of the Executive Committee of the American Veterinary Medical Association, 1909-1910. Before that he was nominated for president of the American Veterinary Medical Association, but withdrew in favour of W. H. Dalrymple. In 1907 he was a member, along with pre-eminent American pathologists and parasitologists, of the United States Special Commission appointed to inquire into certain features of the United States Meat Inspection Regulations; most important of all he was a member of the Commission of the United States Department of Agriculture which formulated

regulations to govern the conduct and standardization of American veterinary colleges.

Surely the young Irishman, who came out to America with the firm resolution to establish a veterinary college in Chicago, builded better than he knew. Life is worth the living when it can be attended with so much success as he has won.

IV.—Albert Hassall, M.R.C.V.S.

In the first two sketches Scotsmen were the subjects; in the third an Irishman. Now we come to an Englishman who has achieved national distinction in America because of his investigations in a field of pure science. Albert Hassall has not endeavoured to make much noise in the world. His forte has been the scientific laboratory; much of his best energy and much of his time has been given to cataloguing scientific works in a definite speciality uninviting to most veterinarians; his renown has been gained without any thought on his part of being in the limelight. He has been a quiet, unobtrusive worker in the capital, Washington, for twenty years—a city where much of the best scientific work of the nation is done, and where the best facilities are to be had for scientific research. Though he has shunned advertisement, his incessant labours in his speciality have made him as noted among scientists interested in medical and veterinary zoology as many another less modest man would be, in less scientific spheres of thought, after the expenditure of much noisy powder by way of advertisement. Hassall is undoubtedly the most noted veterinary zoologist in the United States to-day. There are other veterinarians, like Curtice, who have done remarkable work in veterinary zoology in America. There are other men, not veterinarians, who have written important articles or monographs on some phase of veterinary zoological work. But there is no veterinarian in America so celebrated as Hassall as a veterinary zoologist.

Albert Hassall was born in Plumstead, England, February 12, 1862. He entered the Royal Veterinary College, London, October, 1878, and passed the examinations admitting him to membership in 1880. He came to America in 1886, and engaged in private practice in Baltimore, Maryland. In 1887 he was appointed a veterinarian in the Bureau of Animal Industry,

Albert Hassall

United States Department of Agriculture, and assigned to work in Maryland, where the bureau was then stamping out contagious pleuro-pneumonia. In 1889 he was appointed Professor of Anatomy in Baltimore University. In 1891 he was ordered to Washington and given an assignment in the zoological laboratory. He was appointed Lecturer on Histology in the National Veterinary College, 1892; Professor of Medical Zoology in the same institution in 1896; and Professor of Medical Zoology in the Veterinary Department of George Washington University, 1898. For the last twenty years, therefore, he has been a Professor of Medical Zoology in Washington and zoological expert for the United States Government in the national laboratories, and for twenty-five years a veterinary official for the American Government.

There are men whose gift seems to direct them to do such work as would best prepare the way for the advancement of scientific investigation by others; there are others who content themselves with doing original scientific investigation only. Hassall is one of those fortunate men who belongs to a class which does successfully both forms of work. Referring to the new genus of trematodes, "Hassalius," Dr. Goldberger, in a recent bulletin of the Marine Hospital and Public Health Service of the United States (No. 71), writes that the genus is "dedicated to Dr. Albert Hassall, to whom, jointly with Professor Stiles, all helminthologists are indebted for that invaluable work, the Index Catalogue of Medical and Veterinary Zoology." This index catalogue is indeed celebrated among zoologists, for it is one of the first things of its kind ever undertaken, especially on so large a scale, and it is largely the work of Hassall. One of the difficulties about scientific investigation is the loss of time and energy occasioned by men repeating, unknowingly, the work others have done better before them. The index catalogue assists in doing away with this waste among zoologists. Its compilation has been an immense undertaking, for the United States Government has already published the 29th part of it, closing the 2,256th page. In it, under the author's name, is recorded some of the work as an original investigator in zoology of Professor Hassall.

But perhaps Professor Hassall's best work has been done jointly with Professor Charles Wardell Stiles, of Washington.

With him he is the author of about fifty articles on zoology, recorded in the index catalogue, many of them the results of original research. It is these, perhaps, which have made his name famous wherever veterinary zoology is studied; and the results of the work have aided in better meat inspection, in a better understanding of what were obscure diseases in animals and man, and the means of prevention. With Professor Stiles, Professor Hassall's name must be joined, not only for the invaluable service both of these scientists have done for zoology in the index catalogue, but, through their original investigations of harmful parasites, what they have done for humanity.

[This interesting series will be concluded in the next issue of THE VETERINARY JOURNAL.]

SEPTIC INFECTION OF THE LATERAL CARTILAGES OF THE HORSE'S FOOT.

By W. STAPLEY, M.D., M.R.C.V.S., D.V.Sc.

Lecturer in Anatomy and Surgery, Veterinary School, Melbourne University.

ALTHOUGH the treatment of quittor has often been discussed, it has not reached that perfection that enables quittor treatment to be regarded either as simple or easy.

Removal of a healthy lateral cartilage is a simple operation; a septic lateral cartilage cannot be removed without the field of operation being infected by the manipulation of the operator. Such interference is only successful when attended by luck; usually the local infection is spread to a wider area—sometimes to the pedal joint, occasionally to a general infection. In every branch of surgery extensive operations in the presence of infection is dangerous. No greater surgical heresy can be taught than that by the use of antiseptics a septic lateral cartilage can be made aseptic. If by the use of antiseptics a quittor could be made aseptic, the necessity for operation would be abolished. With some justice those who employ injections in the treatment of quittor may take exception to this remark; the fact remains that until by injection a near approach to cure is established we are unable to say that the sinus is aseptic. There

is an idea amongst some who advocate the removal of the lateral cartilage for quittor treatment, that an infected cartilage never heals until the whole cartilage is destroyed. This idea is based in error.

Providing that a septic lateral cartilage is efficiently drained, reinfection prevented, and the sinuses plugged, it is remarkable how quickly the infection is mastered, and granulation tissue fills in the holes that have resulted from infection necrosis.

The treatment of quittor is the same as the treatment of infection in any part of the body. The first essential is to establish adequate drainage, the second to prevent re-infection.

Both in the interest of the horse owner and of the practitioner quittor cases should be selected for treatment. Cases in which pus has burrowed deeply into the foot behind the cartilage in the vicinity of the pedal joint should not be treated; they bring disappointment to the owner and loss of reputation to the practitioner. Cases for treatment should have the area of sepsis confined to the cartilage and the tissues external to it.

Treatment.—Probes should not be used on quittors; they spread infection and make sinuses where sinuses were non-existent. The hair should be removed from the foot to the knee or hock by clippers, and washed clean in hot salt water. All quittor dressings should be heavy enough to have an osmotic pull towards the dressing. After the foot and limb is cleansed the sinuses of the quittor should be plugged with a paste made of 5 per cent. carbolic acid in glycerine mixed with sulphur, the horn of the foot should be dressed with glycerine, and a gauze dressing soaked in glycerine should be placed over the sinus and the horn forming the covering. This dressing should be left on for 16 hours—from late in the afternoon to the next morning—the time of operation. The object of the glycerine dressing is to soften the horn to enable the hoof to be cut. The vinsol bascule is not suitable for quittor treatment because on subsequent dressings the horse fears it. The English hobbles are clumsy and dangerous; with these we have had two broken backs, and with the vinsol bascule a temporary radial paralysis. The best tackle is Kemp's gear used on a small grass paddock. With this simple apparatus Farrier-Sergeant-Major Boreham, late of the Army Veterinary Corps, casts single-handed heavy draught horses as easily as hacks. Since coming to this school

he constantly laments the fact that in the South African campaign he lacked this simple and safe method of casting. I have tried to trace the use of this gear, and so far I can learn of but one accident that has attended its use—a fractured femur—which happened in the practice of an unqualified man.

With the horse down and secured, a rubber bandage is put on the limb and above it a tourniquet; the rubber bandage is removed and the nerve blocked by endo or paraneural injection of cocaine and adrenalin. As it takes some fifteen minutes for analgesia to be established, the time is best consumed by removing the primary dressing and washing the field of operation with tincture of iodine. The hands are best washed in alcohol. This toilet consumes the time that establishes loss of sensation. With a large curette the outlet of the sinus is enlarged, and the detritus and blood removed with dry sterile gauze. If the rubber bandage has been properly applied and the tourniquet holds, practically no further bleeding occurs. The sinus is traced with a small curette and dead tissue gently removed. At the bottom of the sinus, almost always below the coronary band, the hoof is cut away sufficiently for adequate drainage to be established at the bottom of the sinus through the horn. The coronary band is undisturbed, any healthy tissue blocking the wide mouth of the drain is removed with scalpel and dissecting forceps. Having carefully explored the sinus or sinuses and having established very free drainage, the cavities are plugged with 5 per cent. carbolized glycerine and sulphur, as before operation, and a dry gauze pack is held in place by a string bandage. This outer bandage is soaked in spirits of tar to prevent reinfection and to deter the horse from assaulting it with his teeth. Next day and subsequent days the horse is cast and the sulphur glycerine and carbolic dressing scraped away with curette and wiped off with sterile gauze. On each occasion the sinus cavity is plugged with hot bismuth wax. Under an intelligent application of these methods quittor cases steadily progress to recovery. This method represents no original feature, and all that is claimed for it is that it represents the application of sound surgical principles. They are to cut as much and no more than the case demands, to drain infection, to prevent reinfection, and to use dressings that have attractive properties for discharges. Bier's hyperemic treatment by means of a

tourniquet in our experience aggravates this disease. We have not tried Bier's suction apparatus.

Quittors are troublesome because of defective drainage and sepsis. At all times there is abundant blood in the foot—too much venous blood resulting from the lessened use of the foot—and this condition Bier's treatment aggravates. Unless quittors are very lame we have (under Hunting's suggestion) them exercised, sharing with Hunting the belief that exercise is beneficial to the circulation of the foot. The carbolic glycerine sulphur dressing increases lameness, bismuth wax applied with perfect drainage distinctly relieves it.

SOME NOTES ON THE PASSAGE OF FLUIDS THROUGH THE STOMACHS OF RUMINANTS.

By J. F. CRAIG, M.A., M.R.C.V.S.

Professor in the Royal Veterinary College of Ireland, Dublin.

To the classical researches of Flourens and Colin we are indebted for our present knowledge of the physiology of the stomachs of ruminants. Both these investigators showed beyond doubt that all the solid materials pass after the first deglutition from the œsophagus only into the reticulum and the anterior portion of the rumen. From their experiments they also concluded that fluids and semi-solid material were carried in small proportion from the œsophagus directly through the œsophageal groove to the omasum and thence to the abomasum. The experiments on which they based their conclusions were the following:—

(1) Flourens fed a sheep on some roots reduced to a fine pulp, and then immediately afterwards destroyed the animal and made a *post-mortem* examination. He found the pulped roots in large proportion in the rumen and reticulum, but also in appreciable quantity in the omasum and abomasum.

(2) He also made a fistula in connection with each of the four stomachs and found that fluid escaped simultaneously from these openings whenever the ruminant was allowed or forced to drink some liquid.

(3) Colin made a large fistula into the rumen in the left flank of an ox. In order to ascertain where the liquids passed from the œsophagus he inserted his hand through the fistula into the rumen as far as the œsophageal opening. He found that when the animal drank water that the latter entered in greater part into the reticulum and then flowed over into the rumen. Placing his finger in contact with the lips of the œsophageal groove he found them lightly drawn together, and felt a very small quantity of fluid trickle directly through the groove from the œsophagus into the omasum. This experiment he repeated in several oxen with the same result.

The chief objections to the conclusions drawn from these experiments are: Nos. 1 and 2 do not show that any fluids pass into the third and fourth stomachs through the œsophageal groove without mixing with the contents of the rumen and reticulum. To No. 3 it may be objected that the manipulation altered the normal physiological function of the stomachs and of the œsophageal groove.

Investigations in later years have been made with water tinted with some colouring agent, such as magenta or fuchsin. These fluids have been administered in various ways; in drench, by probang, and with the animal standing or placed on its haunches and the head held back. Immediately after the water was administered the animal was killed and the contents of the stomachs examined.

Vryburg administered two or three litres of water, deeply coloured with fuchsin, by a stomach pump to four adult oxen. The drenching was carried out with the animals in the standing position and the long axis of the head kept horizontal. To two heifers at the Royal Veterinary College of Ireland half a gallon of water, deeply coloured with fuchsin, was given with the ordinary drenching horn; and to a bullock a similar amount of coloured water was administered by probang. A two-year-old bullock was first allowed a bucket of water and then drenched with two quarts of water coloured with magenta. A goat was given a drench of half a pint of water coloured with magenta. During drenching the latter animal was placed on its haunches and the head held back. The animals were destroyed almost immediately after the material was administered and an examination made of the stomachs. In all cases the colouring agent was

found only in the rumen and the reticulum; not a trace had penetrated into the omasum and abomasum. The stain had diffused through the contents of the reticulum, but in the rumen it was present only in the solid food near the walls of the organ.

It might be objected to these experiments that they do not represent what takes place when the ruminant drinks voluntarily of water or the other fluids. At least, however, they show what occurs when medicinal or other agents are given in the form of a drench. These agents are diluted by the contents of the rumen and reticulum before they reach the omasum and abomasum.

Passage of Fluids from the First Two Stomachs into the Omasum and Abomasum.

After a variable period the fluids pass from the rumen and reticulum into the third and fourth stomachs, probably by way of the opening in the reticulum. Vryburg allowed a cow to drink a litre of coloured water and then destroyed it half an hour afterwards. He found the greater part of the fluid in the rumen, but a small quantity had entered the third stomach and stained the upper portion of the leaves of this compartment. The same result was also obtained on killing a heifer which had been given two litres of coloured water by means of an irrigator, half an hour previously. Three other adult cattle were destroyed, seven, eight, and ten hours after the administration of fuchsin solution. In the first case a little of the coloured solution had penetrated into the third stomach; in the second case the contents of the third and fourth stomachs were stained red, but the pylorus was not coloured; in the third case a small quantity of fuchsin had reached the pylorus and entered the duodenum. At the R.V.C.I. a goat was drenched with half a pint of water coloured with magenta and containing 10 gr. of strychnine, and died twenty-five minutes afterwards. The colouring matter was found in the rumen, reticulum, omasum, and at the entrance to the abomasum.

Absorption from the Stomachs of Ruminants.

The mucous membrane of the first three stomachs is similar to that of the mouth. The epithelium is thick, squamous and stratified, and not well adapted for the purposes of absorption.

The fourth stomach is the true stomach of the ox. In the last experiment in the goat, symptoms of strychnine poisoning appeared in about twenty minutes after administration. Probably in that time some of the material had reached the abomasum and was absorbed.

Secretions from the Stomachs of Ruminants.

I have examined numerous sections of the walls of the first three stomachs and have never seen any glands in them. It is said that a few small mucous glands are present in certain portions of the rumen. These glands, if present, cannot however have much effect in increasing the fluid condition of the contents or lubricating their passage. The consistence of the ingesta depends upon the amount of fluid taken in by the mouth as such, or with food, and of the saliva swallowed.

Practical Deductions.

(1) Since all fluids taken in by the mouth must be diluted by the contents of the rumen and reticulum, this dilution may interfere with the action of various medicinal agents in certain cases. This may account for the unsatisfactory results obtained in the treatment of parasitic abomasitis. It might, therefore, be advantageous in these instances to inject the vermicides directly into the abomasum through the abdominal wall. The guide line for this operation is the line of right asternal costal cartilages. The abomasum may be punctured in the ox immediately behind this line at any point within a foot of the xiphoid cartilage of the sternum.

(2) Where the contents of the first three stomachs are abnormally dry, they may be softened, chiefly by water taken in by the mouth or by increasing the amount of saliva secreted and swallowed. The removal of the ingesta is effected by the muscular contractions of their walls. Purgatives, such as magnesium sulphate, act for the most part on the intestines. They stimulate the passage of fluids into the lumen of the bowel by increasing osmosis, and the secretion of the intestinal glands. The mechanical distension of the gut with fluid provokes slight peristalsis. This increased peristalsis may be transmitted thence to the first three stomachs, and perhaps some of the fluid in the bowel

may be carried forward to dilute the contents of the omasum, reticulum, and rumen. Stimulants to the muscle fibres are of the greatest service in producing the desired effect upon these organs. Thus it is that such agents as the strychnine preparations, nux vomica, and the ammonia compounds prove very useful adjuncts to laxatives in cattle. It may be truly said that the combination of stimulants with a moderate dose of laxative will effect what a strong purgative of, say, Epsom salts, fails to produce upon the stomachs of ruminants.

AN INFECTIOUS FOOT DISEASE IN SHEEP.

By Dr. A. THEILER, C.M.G.

Acting Director of Veterinary Research, South Africa.

In May, 1910, we received from J. P. Meyer, Esq., of Rietvlei, near Johannesburg, two feet of sheep with the information that he had been experiencing a lot of lameness among his sheep, which in some instances became so serious that he had to kill the affected animals.

The two specimens were referred to as No. 1 (coming from a case which had been in existence for a year) and No. 2 (from a case of a month's duration) respectively. Mr. Meyer stated that the disease commenced above the hoof and finally invaded the hoof itself.

The specimens were examined and the following notes were taken:—

Specimen No. 1 showed pronounced deformation in length and growth of the horn of the foot, probably due to an affection of the matrix. The matrix of the coronary band showed ulcers and a thick growth of fibrous tissue. It was apparently a sequel to case No. 2.

Specimen No. 2.—The skin of the coronary band was covered with a blood-stained, dry crustation and free from hairs; the matrix of the coronary band was thickened and tumified. The deformation of the horn was just commencing.

The microscopical examination proved the absence of the necrosis bacillus which was suspected to be present, but bacteria of different species were noted.

The cases were diagnosed as an inflammation of the skin, probably of an infectious nature. No definite opinion could be given as to the cause of the disease itself, although it was expected that some micro-organisms would be responsible for the inflammatory process.

In order to trace these organisms fresh cases would be required, so that the necessary experiments could be undertaken with living material.

Accordingly Mr. Meyer was asked by us to send a living sheep to the laboratory, to which request he willingly complied, and forwarded us an affected sheep, which arrived here on June 25, 1910. The description of the case was as follows:—

Sheep, Persian, No. 2763.—Lame on near front leg. There was an ulcerating wound in the coronary band, and on pressure a white pus appeared on several places in and on the border of the wound. The horn below the ulcer was loose, and it was found that the ulcer penetrated into the matrix of the lateral hoof wall, reaching almost as far as the sole. On the coronary band of the off hind food was also an ulcerating wound limited to the coronary band and about the size of a sixpence. It was covered with a crust, on the margin of which pus escaped on pressure. Accordingly we probably had to deal with the same affection on both places, a first and initial one on the off hind foot and an advanced one on the near front foot.

This sheep was kept under observation and, with the exception of an aseptic bandage, no treatment was applied. The object was to find out whether the affection which was observed on the Persian sheep could be transmitted to other sheep by inoculation, and, if such should be the case, whether any specific organism could be found which, when inoculated into healthy sheep, would produce the same lesions.

On July 12, 1910, two sheep, Persian (one not numbered, the other marked with red paint), were scarified superficially on the coronary band of the near fore foot with pus collected from an ulcer on sheep No. 2763.

Persian sheep No. 2234 and No. 2168 were scarified between the claws of the near hind foot, and the same material was placed on the superficial wound. All the feet were then bandaged with an aseptic linen bandage in order to prevent any outside contamination.

Two days later the examination of the feet revealed the presence of a swelling, hot and painful. There was a crust on the place of operation on the "red paint" sheep and on sheep No. 2234. In the unnumbered sheep and sheep No. 2168 the place of operation was tumified, and on pressure small drops of pus escaped on several places where the scarification had been made.

On July 14, 1910, the "red paint" sheep and sheep No. 2234 showed a wound with a superficial necrosis. The "no number" sheep and sheep No. 2168 were discharging pus on pressure.

On July 15, 1910, sheep No. 2234 had a superficial ulcer between the claws, about the size of a sixpence in circumference, with a yellow deposit on its surface.

Sheep No. 2168.—The place of operation was much swollen and very painful, and on pressure pus escaped at several places.

"No number" Sheep.—The wound between the claw reached about the size of a sixpence in circumference, and was discharging pus very freely.

"Red paint" Sheep.—The place was much swollen and painful, and on pressure pus and blood escaped.

In the course of the following days all the wounds sloughed the skin and an open ulcer appeared, discharging pus.

In order to prove the infectiousness of the discharged pus in the wounds of the foot for other parts of the skin, it was decided to smear the pus on to the scarified wounds on the forehead. Each sheep was treated with its own pus. In the course of the next few days the same symptoms were noted on the head, viz., a painful swelling, first with blisters of the surroundings and redness, painful when touched, and the formation of pus, which on pressure escaped, and finally sloughing of the skin on the seat of operation as far as the inflammation had formed an abscess.

There was accordingly no doubt that the cause of the ulcerating wound was due to a virus which propagated when transplanted into the skin. It remained to isolate the organism to obtain it in a pure state, and then again to transplant it in order to produce the same lesions as described beforehand.

The Micro-organism.—When the pus of the original sheep (but particularly that of the inoculated one) was spread out in a smear preparation and stained in the usual way, a small bacterium could be seen to be present in great numbers, but there were also other bacteria present, viz., cocci. When the Gram method

was applied, the small bacterium took the black stain, and by this means its size and numbers could easily be traced. Pus of the inoculated sheep was spread on the slanting surface of a Martin agar tube, when, after a day or two, transparent droplets appeared, growing not larger in size than about that of a pin's head. The droplet was transplanted on to a new tube of slanting agar, and, by means of the condensed water present, spread all over the surface. Over this a thin transparent film grew, but never developed into any thick layer; it remained practically stationary after it had grown into the film. The film consisted of a dense aggregation of very fine droplets. When this culture was examined under the microscope it proved to consist of the above-described bacterium in a pure state.

Transplantations were made on different media, but there was no improvement in the growth observed in the originally used Bouillon-Martin-Agar.

In order to obtain sufficient culture material for inoculation purposes, bouillon was added to the slanting agar containing the growth, which was then detached and developed freely in the liquid. The emulsion was then applied to the scarified surface on the skin of the coronary band, similar to the original transplantation, but out of four sheep only one developed a typical ulcer. It is very likely that the material in emulsion form was not viscid enough to adhere in the wound. Accordingly it was decided to inject a few drops of the culture emulsion into the skin of the forehead of the sheep. The place of injection was shaved and disinfected, as was done in the case of a control sheep, which was, however, not injected. On the place of the injection a swelling appeared in the inoculated sheep with an inflammation of the skin, the swelling rising above the surroundings and reaching about the size of a hazel nut. The swelling burst in the course of the next few days, and a sanguinolent pus escaped when slight pressure was applied. Then an ulcer developed, discharging pus, which gradually healed up.

The microscopical examination again revealed the presence of the typical bacterium abounding in pure culture. The control sheep did not show any reaction. Thus it appears that the bacterium is responsible for the formation of this ulcerating disease, which, accordingly, need not necessarily be limited to the coronary band of the foot, although that part represents possibly

the seat of predilection, probably because wounds frequently occur there.

A disease of sheep, known as "foot-rot," is sometimes very frequently met with in rainy weather on wet places. It must also be due to some organism which, under the above-mentioned conditions, finds its best chance to enter into the skin of the foot and to develop there. It remains yet to be seen whether the bacterium just described is also responsible for that affection.

Treatment.—The foot evil described does not require any specific treatment except one which applies to all ulcerating wounds, viz., thorough cleaning of the wound, preferably by means of warm water and a disinfectant, such as carbolic acid, 3 per cent.; Pearson's antiseptic, 3 per cent., &c., and a dressing of the wound by means of a disinfecting and astringent ointment. A cheap and effective ointment can be made as follows:—

Powdered bluestone, 10 parts; fat, 70 parts; Stockholm tar, 5 parts.

When the ulcer has penetrated into the matrix of the hoof and the horn becomes detached, it is advisable to cut it away and to clean and dress the wound underneath, as mentioned before. When a luxuriant growth or unhealthy granulation develops cauterizing with nitrate of silver can be recommended. It is sometimes noticed that although the wounds have healed perfectly there remains a tenderness on the feet, the sheep still going lame. This will probably disappear when the horn has grown over the wound in the hoof.

SOME *POST-MORTEM* ALTERATIONS OF MEAT.*

By J. B. BUXTON, M.R.C.V.S., D.V.H.

Barnet.

MEAT may undergo a variety of alterations from the time the animal is slaughtered until its preparation for the table.

Let us first consider those alterations which may be said to be due to direct contamination.

As may be readily appreciated by visiting any abattoir during or immediately after slaughter, the risks run by meat of con-

* Paper read at the Birkenhead Congress of the Royal Institute of Public Health.

tamination are very numerous; indeed, it seems wonderful how it can escape.

Frequently the contamination is the result of careless handling, or due to soiling with bile or the intestinal contents. It sometimes happens that in excising abscesses, morbid growths, or areas which have undergone pathological alterations, the surrounding tissue becomes contaminated, although in some cases such an area may be cleansed, yet where the meat has become contaminated with the contents of the intestine or an abscess, mere washing is not sufficient to restore its normal character, since the bacteria which have found their way to the meat are not thereby removed; indeed, the moisture furnishes favourable conditions for their multiplication. In such a case the only safe remedy is to remove the infected surfaces with a knife.

Meat may become contaminated with the larvæ of dipterous insects during the summer months. As to whether their presence indicates long standing decomposition or not is a question which frequently confronts a meat inspector. As a reply, Ostertag states as follows: "Among the flies, the larvæ of which develop in animal material, the house-fly (*Musca domestica*), the blow-fly (*M. vomitoria*), and the flesh-fly (*Sarcophaga carnaria*), may be mentioned. The first two mentioned flies deposit their ova in fresh and decomposing materials of animal origin, and the larvæ hatch within twenty-four hours; while the flesh-fly deposits living larvæ in decomposing material. It therefore appears that the mere demonstration of dipterous larvæ is no proof that the material has been long undergoing the process of decomposition. The length of the larvæ, which varies from 1 mm. on the first day to 10 mm. on the eighth to tenth day, may give an approximate indication of the length of the period of decomposition."

Meat, during its preparation or preservation, may absorb injurious metals. There is, for instance, a case on record of poisoning as a result of eating meat which had been roasted on a spit over a fire composed of wood which had been painted with white lead. Chronic cases of lead poisoning have been seen due to pieces of that metal which had become loosened from badly made mincing machines. Ungar has demonstrated that in tinned meat there is a possibility of enough metal being absorbed to be injurious to health.

Meat may also undergo *post-mortem* alterations in its odour

due to the fact that it is capable of absorbing and retaining odours. It is well known that meat absorbs the combustion products of tobacco smoke. The meat of a pig that had been carried a considerable way in a van disinfected with carbolic acid developed a very considerable odour when boiled or roasted. This, and many similar cases, serve as a warning against conveying meat in odorous vehicles, and also against the use of odorous disinfectants in abattoirs. Cold storage plants should also be free from any high-smelling materials.

An important *post-mortem* alteration of meat is acid fermentation. This occurs in all musculature and the liver. Eber distinguished normal, simple acid fermentation, and abnormal, stinking acid fermentation. The former condition occurs in meat at the time of the appearance of *rigor mortis*. According to Eber, the cessation of rigor is ushered in with processes which, according to the prevailing idea of the matter, are of an acid nature. The meat acquires a peculiar agreeable flavour as a result of this acid fermentation, known as ripening. Later, after about three weeks or even more, traces of H_2S appear. The liver shows typical acid fermentation. When freshly excised it has an alkaline reaction. After twenty-four hours the reaction is slightly acid, and after two to three days small foci of a yellow colour appear in the parenchyma. These areas increase in size, and after eight to fourteen days the liver colour is lost, and the organ becomes yellow. Some authorities consider that acid livers are not in any way injurious, and are really nothing more than "ripened livers."

Stinking acid fermentation, according to Eber, differs from the former. It is frequently seen in the meat of game which has been stored while in a warm condition or has been "heated." The hair is easily detached, the sub-cutis shows a green colour, the musculature is copper red, while its cut surfaces are greyish or dark green. The odour of freshly-cut surfaces resembles that of decomposition, and is increased upon the addition of acid. The reaction is acid, and $NH3$ is absent, while H_2S may be demonstrated in large quantities. The flesh of the ordinary food animals shows this peculiar alteration when stored under such conditions that it is unable to cool, and is termed "suffocated."

Those *post-mortem* alterations which concern us most are due to the localizations of micro-organisms on meat. Owing to

its peculiar chemical composition meat is an excellent medium for fungi of all kinds. The localization of fungi is most likely to occur when the meat possesses a high moisture content due to improper preservation. The red and blue coloration of meat due to *Bacillus prodigiosus* and *Bacillus cyanogenes*, and mouldiness due to *Penicillium glaucum* or *Mucor mucedo*, are only of slight importance, as they usually cause no injury to health. In the latter case, however, the flesh, if it be not in the dried condition, is usually putrid, and for this reason should be seized. In dried flesh the same severity is not necessary. The greater part of these surface growths can be removed by scraping, and cooking destroys what remains. Red sardines have been found to be harmful, the colour being due it was supposed to a toxic variety of *B. prodigiosus*.

The peculiar grey coloration at the periphery of sausages which have been kept some while is not well understood. *B. mesentericus* has been credited with causing it. Some attribute it to a loss of salt as a result of endosmotic processes, as much as 3 per cent. less salt having been found in the periphery than in the interior. According to Glaze, volatile sulphur compounds are concerned in the coloration. The latent green coloration in poorly salted hams and pickled meat, which appears only after exposure to oxygen, is due to the action of H_2S.

Fat shows a peculiar alteration known as rancidity. This was supposed at one time to be due to the appearance of free fatty acids, and the degree of rancidity was estimated by the amount of acid present. It has since been shown, however, that an aldehyde is responsible for the rancidity. Its presence may be shown by collecting the distillate obtained by means of steam, in a hydrochloric acid metaphenylene diamine solution, the degree of rancidity being estimated colorimetrically by the yellow coloration. We have already seen that the *post-mortem* alterations which concern us most are those which are due to the localizations of micro-organisms on meat, and of these by far the most important are those due to the localization of the bacteria of decomposition. These thrive, perhaps, the best of any on meat, but their development may be checked by allowing the meat to cool thoroughly and by preserving it in cold storage, thus retaining its fresh condition for a certain period. When, however, the meat is not cooled properly, or is heaped together while still

warm, or kept in close or badly-ventilated rooms, it becomes a nutrient medium for putrefactive organisms. The extreme danger of eating decomposed meat, even when it has become so after cooking, is shown by the numerous and often serious cases of so-called sausage poisoning, vomiting after eating "high" ham, "high" game, and badly preserved pieces of meat. There are many organisms concerned in the putrefaction of proteid, but perhaps the most important species is *Proteus vulgaris*. In addition to those which liquefy gelatine, Kraus found in decomposing meat five non-liquefying species, one of which closely resembled the *B. enteritidis* of Gaertner. *B. mesentericus*, which is non-pathogenic, but causes decomposition, is found in almost all sausages. Wolff isolated from meat which had caused an outbreak of poisoning, a non-motile organism 1-1.5 micron × .4 micron, Gram+, producing a brush-like growth in gelatine, and growing rapidly on meat, producing an odour of ammonia. Raw or boiled infected meat broth is pathogenic for dogs, causing violent diarrhœa. It was called the *B. celluliformans*.

Putrefaction begins in the parts of the meat exposed to the air, and gradually penetrates into the interior. In "fevered" flesh putrefaction sets in earlier, and penetrates into the deeper parts more quickly. In the case of animals which were not eviscerated at once, superficial and deep putrefaction occur simultaneously and very early. This is due to the fact that the meat contains more blood, and that the putrefactive organisms have penetrated from the intestines into the neighbouring venous trunks. In the case of animals which have died a natural death there is a marked production of gas in the deep putrefaction owing to the fact that not only aerobic, but also anaerobic gas-producing organisms penetrate the blood. In small animals, such as hares and birds, the intestines may be left intact, without bad results, because the small animal bodies cool rapidly, preventing the growth of cadaveric bacteria. Calves in Norway before there was any official meat inspection were allowed to remain uneviscerated until the abdominal muscles and kidneys became discoloured and stinking. Nielsen reports that the fore-parts of a calf so treated were eaten without bad results, while the consumption of the parts in contact with the alimentary canal caused serious cases of illness, whether eaten boiled or roasted. Nielsen endeavoured to discover whether, and under what con-

ditions during the decomposition of animal proteids, poisonous decomposition products of the group of albumoses soluble in water were formed. During his investigations he found that when only a limited amount of air was admitted, albumoses showing toxic action when injected subcutaneously did not appear on the fifteenth day, while when air was admitted, albumoses with very poisonous properties developed in meat which was five days old.

The bacteria of putrefaction are typical obligatory saprophytes. They are found only on dead parts, which are in connection with the outside world, and not in the blood. They may produce acute symptoms of poisoning, because they possess the power of producing poisonous substances. With regard to the essential nature of these poisonous metabolic products, the prevailing view until recent years was that they were crystalline bodies. Brieger isolated numerous crystalline putrefactive products, which, in accord with Selmi, he characterized as ptomaines. To this group belong muscarin, cholin, cadavarin, putrescin, neurin, neuridin, saprin, &c. In 1885 Vaughan isolated tyrotoxicon from poisonous cheese, and since then these bodies have been recognized as the products of the activity of micro-organisms. Chemically they are mostly bodies of comparatively simple constitution, closely allied to ammonia and its derivatives. In the report of his experiments of obtaining ptomaines from decomposing fish, Brocklish states, "The most poisonous properties are possessed by the extraction fluid freshly obtained from putrefactive broth. During the process of obtaining the bases, the toxicity of the extract is more and more diminished, until it sometimes disappears altogether." It is now thought that not only with putrefactive organisms, but also with pathogenic bacteria, it is not so much the crystalline as the amorphous metabolic products which represent the active poisonous bodies. These decomposition toxins, as they are called, according to Scholl, are not completely destroyed until after subjection to a temperature of 100° C. for one and a half hours. Niemann found that the toxins which arise during decomposition persist in the meat for a short time in a very virulent condition, but soon disappear on account of further decomposition. It has, therefore, been recommended that decomposing material which is to be investigated should be placed immediately in absolute alcohol, as

in it the toxin will remain for some time in an unaltered condition. The alcoholic extract is then evaporated, and the residue dissolved in water. Subcutaneous injections of 1.2 c.c. of this aqueous solution will kill guinea-pigs and rabbits if virulent decomposition products are present. Besides toxic elements, decomposition bacteria produce aromatic substances and fatty acids, mercaptan, ammonia, and phenol. The presence of putrefaction may be shown by the presence of ammonia. The tests employed for the demonstration of ammonia are of use, since the characteristic odour of putrid meat may not be very pronounced, and in many cases may be almost absent; further, the alterations in colour—grey to greenish-black, due to the formation of sulphide of iron and consistency, it becoming softer and more fluid than normal—are not always conspicuously present. Although decomposing flesh is alkaline, owing to the presence of NH_3, alkalinity does not hasten decomposition; this is obvious, since in addition to fresh organs, blood also, and lymph extravasations, as well as pickled meat and smoked hams, may possess an alkaline reaction. Moreover, the reaction of decomposing substances varies; an acid reaction, an amphoteric reaction, or an alkaline reaction may be present. The last is, however, the most common one met with in putrid meat. Eber accordingly proposed an objective method of investigation, based on the demonstration of free ammonia. A small quantity of the following reagent is placed in a test-tube, viz., one part pure HCl, three parts alcohol, and one part ether, which is then corked and shaken. A small quantity of the suspected material is made to adhere to a clear glass rod, which is quickly dipped into the test-tube; so that its lower end is about $\frac{1}{4}$ in. above the fluid, care being taken that it does not touch the sides of the tube. If NH_3 be present, a cloudiness appears, which sinks down at the end of the glass rod, or surrounds it. The more advanced the stage of putrefaction, the more intense the reaction; so that in a bad case it may even become precipitated as a white layer on the walls.

This method cannot be considered as proving infallibly the presence or absence of decomposition, as it may possibly give a positive result in healthy meat, such as mutton, pickled meat, &c., due to the frequent presence of trimethylamine, but taken in conjunction with other phenomena of decomposition it is decidedly

useful. The means of detecting putrefactive changes in canned meat are of great practical value, on account of the numerous cases of poisoning which occur after the consumption of such food material. The ends of the cans in the case of well-preserved meat should be depressed owing to the condensation of the steam after the cans are soldered. If the contents are badly cooked and subsequently become decomposed, the ends bulge, due to the pressure exerted by the gases of decomposition. Unscrupulous manufacturers boil the tins a second time, but a second hole has to be bored and afterwards soldered. Tins which have been treated in this way should therefore be condemned just as readily as though the ends were bulging outwards. On opening decomposing cans one finds that the gelatine is discoloured and liquefied. Van Ermengen is of opinion that decomposition is of but slight importance in the ætiology of cases of sickness after eating meat, and bases this statement upon the fact that decomposing fish serves as a delicacy for 300,000,000 Indians, Indo-Chinese, Malays, Polynesians, and negroes of all kinds. Forster points out that among these people decomposing fish, like the pungent cheese of the European table, is used as a condimental addition to rice, and states that we know nothing of the decomposition processes taking place in this and similar food materials, as for example, the fermented eggs of the Chinese.

Phosphorescent rays are sometimes given off from dead meat, whether cooked or raw. This is seen in dark rooms and at night and is due to the presence of phosphorus brought about by certain organisms. The luminous appearance becomes visible in about forty-eight hours, and persists for about eight days, if the flesh does not become putrid. As soon as decomposition sets in the phosphorescence is lost. The best known organisms causing phosphorescence in meat are the *Micrococcus pflugeri* and the *Photobacterium sarcophilium*. The former is a micrococcus measuring about 1 micron in diameter, the latter a short bacillus measuring from 1 to 1.5 micron in length. The luminous phenomena are most active when the flesh is kept at a temperature slightly below 20° C., but it may still be seen at 3° C., or even lower, but begins to disappear above 30° C. This peculiar power acquired by meat of emitting light was noted as far back as 1592 in Rome, where part of a slaughtered lamb became luminous. Musch, in Basle, in 1877, observed that pork which was kept in a receptacle in a pantry, emitted a green light of such

intensity that people were able to recognize each other by it, and to read the time by their watches. Recently many reports have been published concerning similar cases. The following phosphorescent organisms have been demonstrated in sea-water —*Photobacterium phosphorescens*, on salt water fish in general, *P. fischeri*, *P. balticum* (Baltic), *P. indicum* (West Indian Ocean), *P. luminosum* (North Sea). Ludwig demonstrated that *P. pflugeri*, which was found on haddock, could be transmitted to beef, mutton, pork, &c. For destroying phosphorescence it is recommended that the meat be treated with salicylic acid or acetic acid.

Some Methods of Preservation.

One essential condition for the good keeping property of wholesome meat is a careful cooling immediately after slaughter, since the animal temperature is the optimum for the growth of putrefactive bacteria. By the application of so-called preserving agents, it is possible to increase the normal keeping power of meat. These preserving agents are either chemical—generally used in meat preparations—or physical, most commonly used for unprepared meat. Experiments have been made in the preservation of meat in sterile air on board some ships, but apparently with but little success. Emmerich's method of eviscerating and cutting up animals with sterile knives and leaving the skin intact, and covering the cut surfaces with glacial acetic acid, finally packing the joints in sawdust which has been saturated with sodium chloride solution, and dried at 100° C., has been employed. The common methods of preserving meat are salting and pickling. Common salt is used in the preservation of bacon sides, hams, and meat, especially in America and Australia, where large quantities of salt meat are exported. It is either rubbed into the pieces of meat in a dry state (salting), or applied in the form of a salt brine (pickling). Brine syringes were introduced; these have a long needle, through which the brine is injected into the connective tissue between the bones and muscles. By this means it is possible in a short time to thoroughly impregnate large pieces of meat, whereas merely laying it in salt brine would not have the same effect. In large meat-salting establishments brine pumps are used; these are made on the principle of ordinary force pumps. Another method is to pickle in iron tanks, from which the air has been ex-

hausted; it is claimed that this method is much quicker and more uniform than the old process. Pickling by means of the circulatory system has also been tried. The animals are killed by shooting. Pigs are scraped in the usual manner, and then placed on their backs on a trough table, so that the blood may run off. The thoracic cavity is opened and a canula introduced through the left ventricle into the aorta, a pump is then connected, and the right side of the heart opened. The brine is then pumped through the circulatory system, forcing the blood out through the right side of the heart. The process requires about four seconds. After being cut up and allowed to cool the meat is ready for export or smoking. In South America rapid pickling has been tried by passing an electric current through the meat while lying in the brine. The preserving action of brine depends upon the drying effect as the result of the extraction of water. Moreover, sodium chloride has slight disinfecting properties, which consist in a general check upon the multiplication of organisms. Putrefactive bacteria are much more susceptible to the action of salt than are cocci. In general the growth of bacilli is checked by a 10 per cent. solution of sodium chloride; some, however, endure a concentration of 12 per cent. or 15 per cent. in pure cultures in bouillon.

Brine is usually composed of 1 part of saltpetre to 32 parts of common salt, and 2 parts of sugar. Saltpetre is added in order to prevent the discoloration of the musculature caused by salt. The sugar is added on account of its hindering putrefaction; it may, however, cause a slimy fermentation of the brine, which is said to be without effect upon the character of the pickling material.

Smoking, as a method of preserving meat, has been in use possibly longer than any other method. There are two methods employed, slow, and rapid, or hot smoking—the former being the more common. The meat is smoked slowly for several days at about 25° C. Wood only is used, juniper bushes, beech chips with juniper berries, tan bark with mahogany chips, and other waste material from hard wood. Fir chips are avoided on account of the objectionable flavour which they impart to the meat. The preserving action of smoke depends upon the drying effect due to the heat, and also upon the disinfecting properties of the smoke.

Preservation by heat is a good method, and one which is

extensively used. "Corned" beef is treated in this way. The meat is pickled and then boiled thoroughly, spread out on large tables, sorted and packed. The tins are placed in boiling water for from three to six hours, according to their size, they are punctured while hot, to permit the escape of superfluous fat or air, soldered, and again boiled for a few hours.

In South America, South Russia, Roumania, and many other countries meat is cut into strips and dried in air before being consumed; it is dipped into water in order to soften it, or boiled.

Preservation by cold is by far the best method of preserving meat. It causes no alteration in either the taste or the nutritive value, and improves the quality of the meat considerably. Under the prolonged action of sarcolactic acid the meat acquires an unusually tender, soft character. The effectiveness of cold is almost unlimited. The Jakutes still feed their dogs on the meat of mammoths, which have been for thousands of years in the ice of the Lena.

The action of cold does not destroy the putrefactive organisms, but it prevents their multiplication, and may keep them dormant and prevent the development of their proteolytic power. Two methods of preserving meat by means of cold are employed, namely, freezing, and subjecting to a temperature slightly above 0° C. Meat may be kept indefinitely by freezing, but when preserved in this manner, water vapour and putrefactive bacteria may be deposited upon the surface of the meat, and so greatly affect its keeping property when it is thawed out. Freezing is, however, essential in trans-oceanic traffic in meat, while it does not adapt itself to inland trade. In the latter case the best method is to keep the meat at 3° to 5° C., in chambers with an average moisture content of 70 per cent. to 75 per cent., but even under these conditions putrefactive organisms may show a slight growth; it is therefore essential to dry the surface of the meat and keep it so. Under these conditions it will remain undecomposed for several weeks.

The preservation of meat by means of boric, sulphurous, and salicylic acids is but little employed, at least in this country, and is, therefore, of but slight importance. The Swiss and German Governments have prohibited the use of chemical agents in the preservation of meat and meat products, with the exception of salt and saltpetre.

Clinical Articles.

STRANGLES, COMPLICATED BY PURPURA HÆMORRHAGICA, TREATED WITH STRANGLINE.

By Captain A. J. WILLIAMS, F.R.C.V.S., A.V.C.

Mounted Infantry School, Longmoor.

Subject.—A Mounted Infantry cob, age 5 years.

History, &c.—Admitted for treatment on September 4, 1910, showing the usual symptoms of strangles, a submaxillary abscess developing. Isolated and usual treatment.

September 9, 1910.—Strangline 1 c.c. injected.

September 10, 1910.—Submaxillary abscess opened.

September 16, 1910.—Symptoms of purpura hæmorrhagica present this morning, few petechiæ on the nasal mucous membrane, legs swollen in characteristic manner, breast much swollen, swellings hard, hot and painful. Animal bright and feeding. Pot. chlor. ʒiv. in drinking water three times a day, pot. iod. and quinine āā ʒiiss. in bolus three times a day.

September 18, 1910.—Lips and nostrils swollen, swellings in legs a little less, swelling on breast dropsical. Feeding well, and bright.

September 21, 1910.—Increased swelling in both hind legs. Pot. iod. and pot. chlor. continued and strangline 5 c.c. injected.

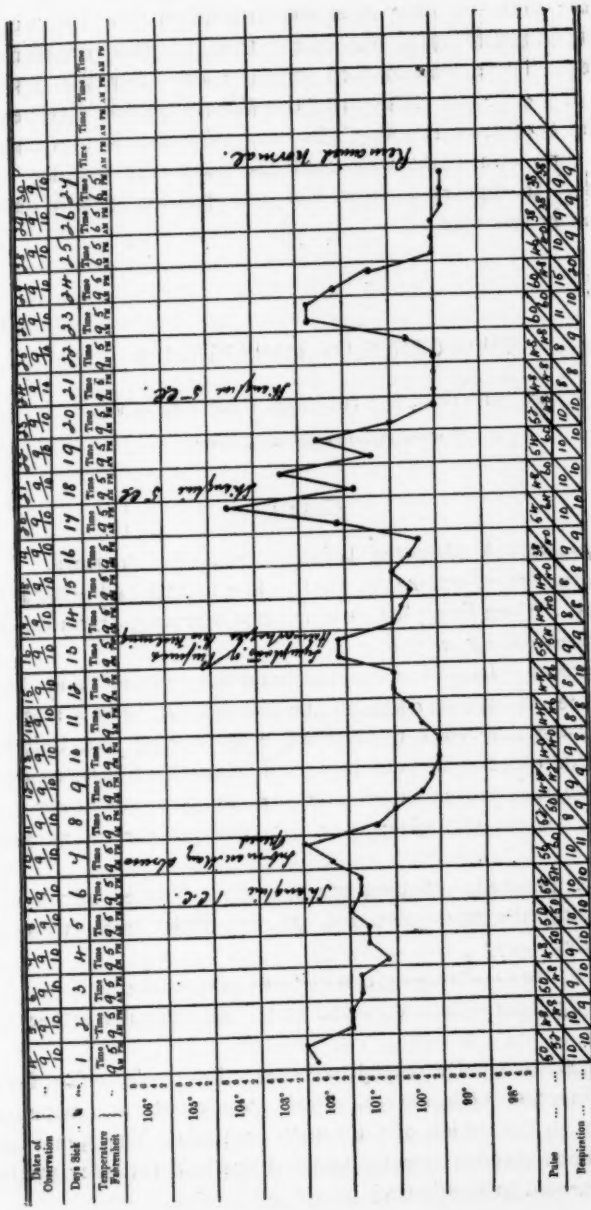
September 22, 1910.—Swellings much less in legs and nearly gone from the lips and nostrils.

September 24, 1910.—Swelling nearly gone from both fore and near hind; off-hind still enlarged; petechiæ on nasal mucous membrane very faint. Strangline 5 c.c. injected.

September 30, 1910.—The swellings quickly disappeared after the last injection of strangline. There was a large reaction, swelling down to the shoulder and under the breast, but it has practically gone now.

October 14, 1910.—Discharged cured, to light duty.

Remarks.—Purpura hæmorrhagica usually occurs during a severe attack of a debilitating disease, when the vitality is much lowered and the disease protracted. In this case the attack of strangles was a mild one and running a normal course when the complication suddenly manifested itself.



Captain Williams's Case of Strangles and Purpura.

At the time this case occurred, strangline (see VETERINARY JOURNAL, August, 1910) was being tried for the treatment of strangles. There was marked improvement after the first injection of 5 c.c., and all signs of the disease quickly disappeared after the second injection. This was very satisfactory, as up to the time strangline was used the case was making little progress. It appears to have had a bactericidal action on the organism in this case.

TWO CASES OF PARAPLEGIA.

BY CAPTAIN A. J. WILLIAMS, F.R.C.V.S., A.V.C.

Mounted Infantry School, Longmoor.

CASE I.

Symptoms.—A Mounted Infantry cob, age 15 years.

History, &c.—January 21, 1911.—The animal had a hard day yesterday. When being led to water this morning, at 7 a.m., she was noticed rolling in gait.

Symptoms.—Inco-ordinate movements, crosses hind legs, catches toes of fore feet against the ground, worse at a trot and when turning, nervous expression, eyes staring and bulging. When blindfolded symptoms increased, plaits hind legs, tends to fall backwards, moves to off side and can only get along with difficulty. Aloes ʒiv. given, pot. iod. and pot. brom. ʒi. twice daily.

March 30, 1911.—Moving much better. Turned into a paddock during the day. Pot. iod. ʒi. and Pulv. nucis vom. ʒi. twice daily.

April 7, 1911.—Paraplegic symptoms still marked.

April 23, 1911.—In a very bad state; has difficulty in keeping her feet.

April 26, 1911.—Destroyed by venesection, under chloroform.

Post-mortem appearances.—Brain congested, an organized blood-clot in the region of the fourth ventricle. The spinal cord in the lumbar region showed hæmorrhage into the grey matter, section normal in consistency

CASE 2.

Subject.—A Mounted Infantry cob, age 16 years.

History, &c.—February 8, 1911.—When brought out of the stable this morning she was noticed rolling about. Marked paraplegic gait, plaits hind legs; worse at a trot and on turning. Pot. iod. and Pulv. nucis vom. 3i. of each was given twice daily.

March 8, 1911.—No change. Treatment continued.

March 22, 1911.—About the same. Medicine discontinued.

April 26, 1911.—Destruction carried out as in Case No. 1.

Post-mortem appearances.—An organized blood-clot in the region of the fourth ventricle. On laying bare the spinal cord in the lumbar region a large amount of fluid could be seen in the sub-dural space. On removing a portion of the cord, a quantity of fluid escaped; also dripping from the cord after the removal. The cord was quite firm in section, as if sclerosed.

CASTRATION OF A DOUBLE RIG.

By J. J. O'CONNOR, M.R.C.V.S.

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A very big two-year-old of the hunter class.

Operation.—Cast, anæsthetized, fixed in the dorsal position with the long rope, flexing and spreading the hocks as much as possible and fixing up the fore limbs with stirrup leathers, Rarey fashion. Taking all aseptic and antiseptic precautions (cleaning out the sheath and covering the feet with antiseptic towels), I incised a transverse fold of skin over the near external inguinal ring, making an antero-posterior wound about 4 in. long. Beneath the skin there was a large plexus of distended veins, whose diameter was equal to that of a man's thumb and which felt somewhat like the epididymis. I carefully explored the inguinal canal and found there the epididymis enclosed in a fibrous sheath, opened the latter, but could not draw out the testicle through it. Consequently I passed my hand to the uppermost and outermost part of the canal, punctured its anterior wall with a perforator, inserted my first and second finger into the opening thus made and soon found the testicle, which was soft and flabby, about equal in size to that of a pullet's egg. I

removed it by means of the ecraseur, plugged the canal with sterilized gauze, and sutured the skin wound and dusted its vicinity with iodoform. I next proceeded in exactly the same way on the other side, in which the same condition of affairs was experienced.

In my opinion the procedure is easier in the complete than in the incomplete abdominal cryptorchid, as in the latter case the presence of the tunica vaginalis and epididymis in the canal hampers the operator by coming in his way during exploration. The opening in the tunica vaginalis is so small and non-dilatable that it is impossible to draw the testicle through it, even when the latter is small. I never hesitate about opening into the abdomen in such a case. I removed the plug in forty-eight hours. The horse was very little troubled by the operation, the resulting swelling was less than after an ordinary castration, which is my usual experience when a normal testicle has not been removed at the same time. No exercise was allowed for ten days, then only at a walk. I am never anxious to exercise after rig castration. Any swelling that forms is harmless; indeed, I think it is useful in preventing any tendency there might be to eventration of the bowels, which, however, has not occurred in my experience. With such small openings, situated high up, there would be little danger of its occurring in this or similar cases, but it is well to "make assurance doubly sure."

The horse was kept in a loose box and not allowed too much bulky diet; the wounds were splashed daily with antiseptic lotion. The animal was discharged in a fortnight after the operation.

THROMBOSIS OF THE ILIAC ARTERIES.

By J. J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A seven-year-old bay carriage mare, of somewhat peevish temperament, lashing out when one attempted to handle her hind limbs.

History.—After trotting for about ten minutes the mare became lame in the near hind limb, showing a difficulty in taking it forward. As she progressed further the lameness be-

came more marked and eventually she stopped, refusing to go any further and showing symptoms of general distress. This was the only available history. I saw the mare trotted in the ring at a fast pace and fully ten minutes elapsed before the lameness became distinct, when she was not pressed further. This amount of exercise was not sufficient to cause sweating or much distress, but for about five minutes after it the mare seemed to suffer stinging pain in the affected limb, lifting it frequently. The veins on the lame limb were not so prominent as those on the other limb, and the former was colder than the latter. A rectal examination was not made. The case had already been diagnosed by another veterinary surgeon, who kindly allowed me the privilege of seeing it just before destroying the mare.

Post Mortem.—A large pale clot was found distending the posterior aorta at its division into the iliacs, all of which, except the right external iliac, were apparently completely occluded. There was a large aneurism with calcareous walls in the posterior mesenteric artery. It was said that this mare's mother suffered from the same affection.

RUPTURE OF THE COLON IN A HORSE.

By J. J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A very old bay gelding, the property of a hawker.

History.—The previous day the horse got a big feed of grass cut from a garden, after which he showed symptoms of colic, for which the owner administered about a pint of oil, and as no improvement occurred, it was sent in for treatment.

Symptoms.—The animal was extremely weak, barely able to stand, and was in a condition of profound dejection, with imperceptible pulse. A stimulating draught was administered, after which the horse, which was on the grass in the quadrangle, kept backing, and vomited, with slight regurgitating noise, a small quantity of food material, which escaped through the nostrils. Within one hour afterwards he died.

Post Mortem.—The moment the abdominal cavity was opened

it was seen to contain large masses of ingesta formed of grass, with an admixture of considerable amount of sand (the animal came from Sandymount). A large complete rupture was found in the first part of the double colon, all of which was impacted with the ingesta described. On handling the bowel it was found to be very friable, rupturing on the slightest traction, although the *post-mortem* examination was made within four hours after death. The stomach was not ruptured.

SINUS IN THE AXILLA OF A POLO PONY.

By J J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A very valuable six-year-old black polo pony.

History.—Eighteen months previously the pony had been staked in jumping a fence, the stake entering the caput muscles from the posterior aspect of the near axillary region. Apparently no portion of the stake could be found in the wound at the time and it was treated in the ordinary way, but without success. Different remedies were tried without avail. A persistent sinus developed, said to be 22 in. in depth at first. Eighteen months after the accident the case came under my charge.

Symptoms.—Lameness characterized by stiffness in the shoulder region of the near fore limb; a suppurating orifice barely admitting the tip of the little finger to the inside of the point of the elbow, a probe was passed into the opening for a distance of about 6 or 7 in., revealing a sinus extending upwards and forwards whose blind extremity felt hard.

Treatment.—The animal was cast and anæsthetized and the orifice enlarged upwards for a distance of about 3 in. On inserting the first finger into the passage I felt a hard foreign body in the depth of the sinus, and grasped it with a strong forceps. After a little effort I extracted the broken-off top of a cut hawthorn bush, measuring 4 in. in length and 1 in. in breadth. I then dressed the wound with tinct. iodi. for a few days and afterwards kept its lips clean with ordinary antiseptic lotion, whilst dry dressing was insufflated into the wound, which

was completely healed in four weeks after the operation, when the pony was discharged quite sound.

According to the history the sinus was 22 in. deep soon after the accident, whilst just before the operation it was 6 or 7 in. in depth, showing that the foreign body tended to become extruded.

ABNORMAL QUANTITY OF FAT IN THE TEMPORAL FOSSA OF A HORSE.

By J. J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A big chestnut trotting horse, which had won trotting prizes.

History.—For some months past a swelling had been forming in the left temporal fossa and the horse had become troublesome and dangerous to drive in the city, shying badly on the side of the affected eye.

Symptoms.—A prominent doughy swelling in the near temporal fossa, extending above the level of the supra-orbital process. The corresponding eyeball was considerably protruded from the orbit and affected with a cataract. The horse was very nervous and resented the affected part being manipulated.

Treatment.—I cast and anæsthetized the horse and made an incision in the skin over the centre of the swelling and found that it was composed entirely of fat, some of which I removed. I then decided to extirpate the eyeball and did so at once, considering it the best way to get rid of the trouble from shying and restiveness in the streets. Plugged the orbit with antiseptic gauze and removed it next day. The second night after the operation the horse bled profusely from the nose, the bedding, walls and manger being heavily stained with blood. The bleeding had stopped spontaneously by the time the horse was seen in the morning and it never recurred. I do not know what was the cause of it. The wounds healed and the horse has been working now for months on the streets in a hackney car, cured of shying.

P.S.—Since writing up this case I have seen the horse, which

has just been brought to me on account of a snoring noise in the right nasal chamber, due to some obstruction there, the nature of which I have not yet ascertained.

NOTES ON SOME USEFUL SURGICAL INSTRUMENTS.

By E. WALLIS HOARE, F.R.C.V.S.,

Cork.

Those of us who have a *penchant* for investing in new instruments generally find that after a number of years they are in possession of a heterogeneous collection, amongst which are many inventions and patterns that are "laid on the shelf"; not sufficiently ancient to be preserved as relics, and still having cost so high a figure that we do not like to cast them into the "cave of oblivion." Instruments are discarded for many reasons: some are so clumsy in make that we soon replace them by more modern types. At one time the idea prevailed that veterinary instruments should be of enormous strength and bulk, probably a superstition handed down from the early days. Others are thrown aside because they have not fulfilled the functions attributed to them by their inventors and manufacturers; their virtues looked well when described in the instrument catalogue, but when tried they were found wanting. Others, again, were made with such inferior material that they gave way on being used for the first time. It will generally be admitted that in the present day there is a vast improvement in veterinary instruments, both as regards practical utility, portability and manufacture.

The advances which have been made in veterinary surgery have necessitated this improvement in instruments, and it must also be admitted that we have adopted many of the modern patterns used in human surgery.

As surgery is an art as well as a science, it follows that at every operation the practitioner learns something new, and centres his attention on the technique so that he may improve his knowledge in this direction. It is on these occasions that he learns the value or otherwise of new instruments, and devises improvements on those already in use.

I venture to draw attention to the following instruments, although it is possible that they are already known to many practitioners.

Artery Forceps.—Of the making of artery forceps "there is no end," and a very large number of patterns are on the market.

The following patterns I have found very useful:—

Mayo-Oschner's Forceps (Fig. 1).—In this, as will be seen from the illustration, the blades of the forceps terminate in sharp teeth; one is a single tooth, the other is bifid, and when closed the former fits tightly into the latter.

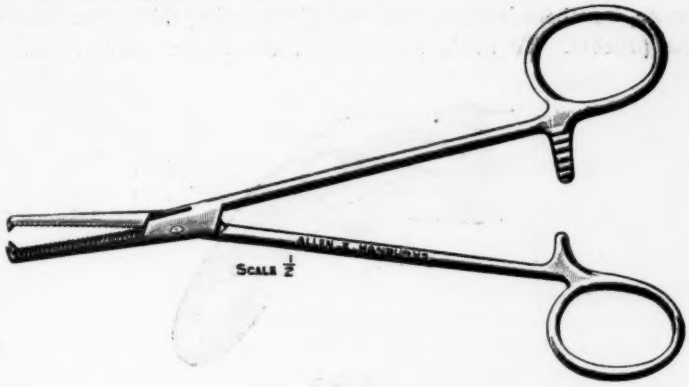


FIG. 1.

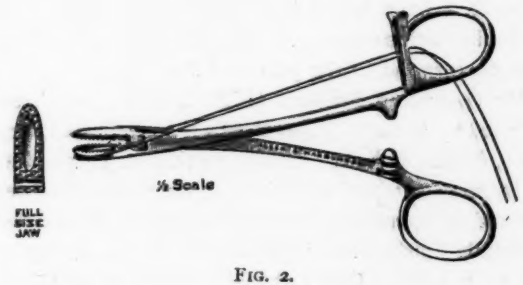


FIG. 2.

This forceps is very convenient for taking up deep-seated vessels of any size, and it can also be used as a pressure forceps, as the blades are serrated above the teeth. Even the smallest vessels can be secured with facility.

Shoemaker's Forceps and Ligature Holder (Fig. 2).—In this,

by means of a groove on the point of one of the blades and a spring on one of the handles, the ligature is placed in position before the forceps is applied to the vessel, hence in the case of a deep-seated vessel, once it is secured, it can be ligatured with certainty, as there is no risk that the knot will be tied on the point of the forceps. With ordinary forceps, under the above conditions, the difficulty of secure ligation is well known.

Finger Guard (Fig. 3).—This was invented by Dr. Child. In making dependent openings for the purpose of drainage in the case of extensive wounds, fistulous withers, poll-evil, &c., it is well known that the finger makes the most efficient director and probe, but there is always the risk of wounding this organ during the process. To avoid this danger, the finger guard is indis-

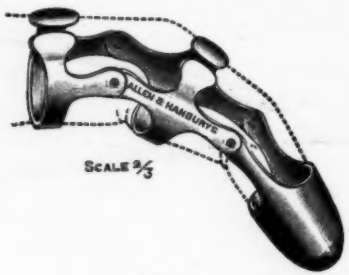


FIG. 3.

pensable, and I have found it a most useful surgical accessory. It is made in various sizes to suit different individuals, and is jointed to correspond to the joints of the finger.

Mayo's Operating Scissors (Figs. 4 and 5).—These are the patterns used by Messrs. Mayo Bros., the celebrated surgeons, of Rochester, Minn., U.S.A. Every practitioner knows the value of scissors in surgical work, especially in the removal of deep-seated tumours and in operations for scirrhus cord. These instruments are beautifully finished and a pleasure to use, and they cut almost as clean as a knife. One pattern is straight, and can also be used as a blunt dissector when closed. Another pattern is angular in shape.

Lynn-Thomas's Self-threading Needles (Fig. 6).—The illustrations show the mechanism of these needles. Threading is carried out with the greatest facility, a matter of importance during

operations, especially to those of us whose sight is not as good as it used to be. In the case of small needles the advantages are still more apparent.

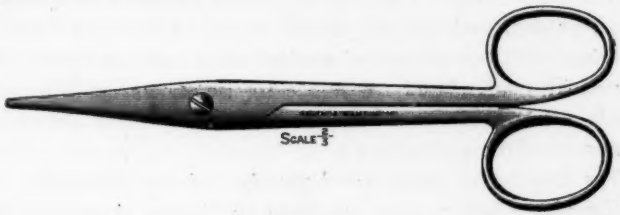


FIG. 4.

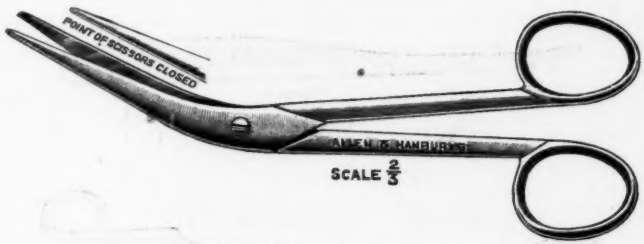


FIG. 5.

FIG. 6.

Dissector (Fig. 7).—Every practitioner who does much surgical work appreciates the value of a blunt dissector in the enucleation of tumours. It saves much labour, and in many situations is far safer than the knife. A very useful pattern is Arbuthnot Lane's, of which an illustration is given.

Obstetric Forceps for the Bitch (Fig. 8).—I suppose all canine surgeons possess a large supply of obstetric forceps. At any rate, I have almost every pattern, and should be glad to dispose of many of them cheap. The only real useful forceps I have invested in is that designed by Mr. Henry Gray, M.R.C.V.S., and for small bitches it has proved of marked value and assistance. It is very easily manipulated, very safe to use, takes up little room, affords a firm grasp, and has little tendency to catch the mucous membrane of the genital canal.

The illustration shows the shape, &c., of the instrument.

The above instruments are made by Messrs. Allen and Hanbury's, Wigmore Street, London.

FIG. 7.

FIG. 8.

Blunk's Hæmostatic Forceps.—The suppression of hæmorrhage without applying a ligature to the bleeding vessel is of advantage in some instances. I have found the above forceps very useful in the castration of dogs and cats. By the application of gentle pressure, hæmorrhage from the spermatic artery is efficiently prevented, and the operation is rendered far simpler and quicker than by the application of a ligature; the results are also more satisfactory.

The inventor claims that vessels of any size can be efficiently sealed by this instrument, and the experiments carried out appear to support this statement. However, in one instance, I used

it in the case of a diseased spermatic cord in the dog and the result was not satisfactory, hence I have not employed it in the case of large vessels, and cannot state whether it is efficient or otherwise in this direction.

Malloch's Mouth Gag.—The existing mouth gags for the horse leave much to be desired as to convenience in use, portability, and price. Moreover, there are occasions on which they are absolutely dangerous to insert, especially in the case of young unhandled horses; they are troublesome to insert and often difficult to remove from the mouth.

The above instrument, which is invented and made by Mr. R. M. Malloch, M.R.C.V.S., of Kirkby Stephen, is one of the most useful instruments I have met with. It consists of two plates of iron formed in the shape of a wedge, and fitted with a handle. It is inserted between the molar teeth on one side,

FIG. 9.

and retained there with no difficulty; by its use an excellent view can be obtained of the horse's mouth and teeth, and the latter can be easily examined. By changing the instrument to the other side of the mouth the molar teeth of the opposite side can be examined.

The horse seldom resists the application of the gag, and should he happen to fight, it can be removed immediately. It can also be used as a balling-iron, and is very portable, while last, but not least, the price is so moderate that it is within the reach of all. The importance of examining the mouth and teeth is well-known, and I think that all practitioners who try this little instrument will find that it will prove a most useful addition to their list of appliances.

Hypodermic Syringes.—A vast improvement in these is the pattern brought out by Messrs. Parke, Davis & Co., in which the

plunger is of metal and fits accurately to the glass barrel (fig. 9). This syringe works splendidly, and, when furnished with a proper needle, is a pleasure to work with. By a proper needle, I mean one that is of fine calibre and short in length; not one of those formerly employed in veterinary practice, which resembled more a cannula than a needle. It was imagined that because the horse and cow were large animals the hypodermic needle for use on them should also be large—a fetish which is now rapidly becoming exploded.

Another useful syringe is the all-metal one, similar to that used by dentists. This is of great value when it is desired to inject a local anæsthetic into dense structures, as considerable force can be employed.

Canine Clinical Notes.

A DIVIDED SPLEEN.

By O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.,

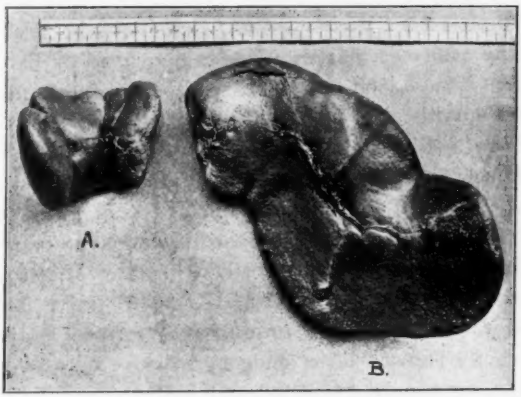
Principal of the Royal (Dick) Veterinary College, Edinburgh.

In the course of the dissection of a young Irish terrier dog a condition of the spleen was encountered which can scarcely fail to be of interest to the anatomist, and may possibly be worthy the attention of the pathologist also. The spleen was nearly twice the size of the normal organ in an animal of the same breed, and weighed some 411 grm. Its surface was studded with numerous, rounded, pale elevations, and a naked-eye section showed that the whole interior of the organ contained like structures. Microscopic examination proved these to be splenic lymph-nodules (*Malpighian corpuscles*), larger and far more numerous than occur in the normal organ. The microscope, however, did not reveal any pathological change other than this hyperplasia of the lymphatic tissue.

To the anatomist the most interesting feature was the division of the organ into two parts. The smaller portion (A in the photograph) represented the somewhat sharply-curved dorsal

extremity of the normal spleen, and, though entirely independent of the larger ventral portion (B in the photograph), was in contact therewith. In other words, the organ was a perfectly-formed spleen with an interruption in the continuity of its tissue; a circumstance which prevents one regarding the smaller fragment as an accessory spleen. In cases of true accessory spleen there is a normally-shaped organ with one or more small, rounded collections of splenic tissue in its vicinity.

Failing more information, little can be said with certainty regarding the cause of the abnormality. It is easy to say that the specimen illustrates an aberration in development; but why the aberration occurred is not clear. As is well known, the



spleen develops as a mass of mesodermic cells in the mesogastrium; the shape of the growing mass undergoing change dependent upon the pressure exerted by surrounding viscera. In the present instance, however, mere pressure seems scarcely sufficient to account for the division, since the two parts together reproduce the shape of the entire normal organ.

Those who have examined a series of subjects in which the abdominal organs have been fixed and hardened *in situ* will remember that the dog's spleen normally presents a constriction of variable depth on or about the level at which the organ at present being considered is divided. One might say, therefore,

that the division is merely an exaggeration of the customary constriction. Further observations are necessary, and the object of this note is to call the attention of those to whom opportunity offers.

CHRONIC BURSITIS IN IRISH WOLFHOUND.

By J. J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A champion Irish wolfhound.

History.—A swelling had developed over the left tuber ischii, and had been opened but refused to heal.

Symptoms.—A callous ulcerous wound on the left buttock, forming the orifice of a fairly large cavity, lined by hard, lumpy granulations or vegetations of varying sizes; evidently a case of chronic bursitis.

Treatment.—Fixed the dog in the ventral position on the table. Injected 4 per cent. cocaine in four places around the swelling. Enlarged the opening and dissected away the lining of the cavity, thus removing all the callous tissue; dressed the cavity with tinct. iodine and inserted a pledget of gauze soaked in this solution. Dressed afterwards with tinct. iodine and antiseptic powder, but hard granulations formed in the wound and the cavity showed little tendency to close in. Silver nitrate stick was then applied to remove the callous granulations, after which chinosol lotion and dusting powder were used, but still the cavity was not diminishing in size. Strong ammonia and turpentine liniment was then applied to the wound and rubbed into the skin in its vicinity, and nothing more was applied to the wound for about ten days, when it seemed to be getting smaller and assuming a more healthy pink appearance, but yet the process of healing seemed very slow, and in order to stimulate it a biniodide blister (1-8) was applied to and around the lesion, which was then left alone, and it gradually healed completely, but the cicatrical tissue was very indurated, a hard nodular scar being left at the site of operation. The habit which the dog had of lying on his buttocks was a great obstacle

to healing and accounted for the induration. The bursa on the other side was also enlarged, but did not require treatment. The case was one in which the cause continued to operate. It was impossible to prevent the animal's lying down in the fashion mentioned. The hyperæmic treatment with liniment and blister was the only effective one.

FISTULA THROUGH THE RADIUS OF A RED SETTER.

By J. J. O'CONNOR, M.R.C.V.S.,

Professor in the Royal Veterinary College of Ireland, Dublin.

Subject.—A red setter dog.

History.—The animal had been attacked by another dog which inflicted a wound on the middle third of the right forearm, which the owner thought would heal in the ordinary way, but it refused to do so, and after the lapse of three months the dog was brought for treatment.

Symptoms.—A bony enlargement involving the anterior and lateral aspects of the right forearm, hot and painful to the feel, and showing two weeping orifices, one on the inside and the other on the outside of the swelling. Although the animal put weight on the limb, he was very lame.

Treatment.—Anæsthetized with chloroform, applied a tourniquet in the upper region of the forearm, incised and reflected the skin at each orifice, and curetted the sinuses with a sharp curette, making a cavity in the bone and causing the two orifices to communicate through it; dressed the wound with tinct. iodine and a mixture of iodoform and boric acid, plugged the cavity with sterilized gauze squeezed out of tinct. iodine, and covered the affected part with sterilized pad and bandage; renewed the dressing daily. After a fortnight a small piece of loose bone came away. The discharge from the wound then gradually diminished until it stopped altogether, the animal making a good recovery, the lameness disappearing.

Reports.

VETERINARY POST-GRADUATE STUDY.*

By STEWART STOCKMAN, M.R.C.V.S.,

Chief Veterinary Officer to the Board of Agriculture.

A CUSTOMARY remark from benevolent old gentlemen to small boys is, or at least used to be, "What are you going to be when you are a man?" As I do not wish you to look upon me as a benevolent old gentleman, but rather as one who has gone a certain way along the professional road you are about to traverse, I promise not to treat you as children. Still, gentlemen, if you have not already done so, you must sooner or later ask yourselves what you are going to do when you are qualified, and this brings me to one part of the subject upon which I propose to address you, namely, post-graduate teaching and post-graduate study. It may seem somewhat curious to address advice to men on post-graduate study before they have finished, and before some of them have even begun, their undergraduate course. The direction of the latter, however, is provided for by the system of professional education obtaining in this country, which requires students to attend a course of theoretical and practical instruction under teachers at recognized teaching institutions, and afterwards to pass through the ordeal of examination as a test of efficiency, thus compelling them to acquire a certain amount of knowledge before they can pass from one stage to another, and finally qualify. The course of study prescribed for intending graduates in veterinary medicine and surgery is, having regard to its purpose, as wide as that of other professions, but it must be remembered that the amount of knowledge which seems fair to insist upon the average student acquiring in a specified time is necessarily limited; therefore a syllabus of examination is introduced. A teacher may or may not teach within the limits of this syllabus. He may even think it his duty to do so, but most students are likely to confine their more strenuous efforts within its boundaries, and they can hardly be blamed for this, since it increases their prospects of passing the examinations at the earliest date possible. The restricting influence of this system may be counteracted by prescribing a wider syllabus. That, however, means a longer period of undergraduate study, and as the majority of students, even the most enthusiastic, take up a profession with the object of making a livelihood by supplying a public want, it does not seem advisable that they should be too long debarred from practising their profession, should they desire to do so, nor that the expenses connected with their tuition should be disproportionate to the average income available from it. Further, al-

* Opening Address delivered at the Royal Veterinary College, London, October, 1911.

though it must be freely admitted that study and teaching up to a certain point expedite the acquisition of skill, which is an indispensable factor in the successful practice of the medical art in all its branches, and that they open up wider fields for its application after it has been acquired, no amount of learning and tuition without practice will make a man skilful in any branch of the medical profession. The minimum time a student should be asked to devote to the study of the multiple rudiments of a profession like medicine has given rise to frequent controversy, which for the present has resulted in the presiding bodies imposing a general curriculum of a comprehensive character, leaving the further pursuit of subjects now universally admitted to require special teaching to those who are able, and disposed, to follow them. The universities and colleges have organized post-graduate teaching in connection with some of these subjects, and several medical colleges, exclusively devoted to post-graduate teaching, have recently come into existence.

Certain veterinary colleges in this country have made more or less provision for post-graduate teaching and it is gratifying to know that the post-graduate course of the Royal Veterinary College, London, has acquired a unique reputation throughout the British Empire. Special degrees and diplomas are granted by the universities and colleges to those who have attended a course of post-graduate teaching, and passed further examinations. The Body presiding over veterinary education in this country, The Royal College of Veterinary Surgeons, has not yet seen its way to grant a post-graduate diploma, conditional to candidates following a special curriculum, and passing further examinations, but it has approved the principle, and has signified willingness to put the latter into practice, when its funds enable it to do so in a manner befitting its public responsibilities. It is to be observed, however, that the scope of these courses of study for post-graduate degrees and diplomas is necessarily limited, that a syllabus of examination is introduced, and that a pass standard is fixed; the students are still in the position of being taught *in statu pupillari*. Yet, with all its defects the system has much to recommend it, and it supplies organized teaching of a more advanced kind to formed classes of men who desire to become more proficient in certain subjects. Supplementary diplomas afford evidence of a desire on the part of the holders to obtain more than a bare qualification, the additional learning forms a broader basis for a future superstructure, and they have also a commercial value, something the possession of which professional etiquette allows you to advertise by placing letters after your name, something which at least receives consideration should you apply for a public appointment. I would advise you badly, were I to dissuade you from post-graduate degrees and diplomas, but I would like to qualify this advice with a warning not to submit yourselves for too long a period of your lives, or at too mature an age, to those forms of instruction which bear a resemblance to spoon-feeding. The most

desirable kind of post-graduate degree would seem to be one which might be granted to aspirants after a suitable examination, or for original work submitted, in recognition of extensive knowledge and skill in specified subjects, which their powers of self-education have enabled them to acquire by practice and study several years after their days of tuition. But, gentlemen, a man may take many degrees or diplomas by tuition and examination, he may even become very learned, and yet be a comparatively useless person in a profession which is an art founded upon science, and it was not so much to post-graduate study by following a conventional curriculum and taking a diploma I intended to draw your attention, as to that kind of education a man may seek out for himself, and to a certain extent direct.

The position of the veterinary practitioner is the most difficult in this respect. Veterinary clinics and hospitals, where a large and varied number of medical and surgical cases can be seen daily, are only to be found at veterinary schools in very populous cities like London, Paris, Berlin, and Vienna—schools, moreover, which lay themselves out for clinical teaching. Further, the possession of a practice from which he dare not be long absent is an obstacle the practitioner cannot afford to disregard. Still, few men start general practice on their own account for some years after they have received the qualifying diploma, and those who are able to continue their studies will gain more knowledge of clinical medicine and surgery in six months by a well-designed course of post-graduate study at one or more of the large veterinary schools, than they will acquire by years spent in general practice. The fees involved are almost negligible, the cost of living as a student in a foreign city is not great, and the expenses of travelling need not be prohibitive. A graduate might attend the clinic and *post-mortem* room, he might arrange to have the *entrée* to the chemical, physiological, and pathological laboratories, where he can receive direction in relation to the carrying out of chemical and physiological tests applicable to the body fluids and excretions, and be in a position to practise with material from the clinic the bacteriological and other methods which can be made use of in practice, principally in connection with diagnosis and treatment. He will probably have to make the selection of his own cases, and collect his material, but that is more an advantage than a drawback.

Those who desire to become more proficient in matters relating to State veterinary medicine would be well advised to take out a course of instruction in the ordinary technique practised in pathological and bacteriological laboratories, and to follow this up by spending several months in one or more of these laboratories, assisting the staff, and learning from them by conversation and observation.

In dealing with the suppression of epizootics prompt and accurate diagnosis is the starting point of everything which leads to success, and an error may lead to the most disastrous results, in some cases even to a national calamity. Further, a

veterinary inspector, whether he serves under the central or local authorities, occupies a somewhat unique and very responsible position in relation to diagnosis. Under the Diseases of Animals Act of 1894, the certificate of a veterinary inspector is conclusive evidence in a court of law that disease exists, and practically every Order of the Board of Agriculture lays down that an official diagnosis in respect of all scheduled diseases is to be made by a veterinary surgeon occupying the position of veterinary inspector.

The veterinary surgeon, then, who intends to take up preventive medicine should not only extend his clinical experience of the contagious diseases of animals, but he should devote a good deal of his time in the laboratory to making himself acquainted with the technique and proper application of histological examination, and of those bacteriological methods which are of very considerable value in the diagnosis of bacterial diseases in their occult stages. The behaviour of the test animals of the laboratory towards the viruses of these diseases should also receive much attention. It is not suggested that technique alone will make a man an authority on veterinary sanitary science. It is obvious, of course, that he must also devote much study to the multiplicity of factors which operate in the dissemination of disease, and to methods of control and eradication; that is, to those subjects which have been grouped under the heading of epizootiology. The best fields for educational efforts of this kind are again the laboratories of the veterinary schools with large clinic and the laboratories of State departments. It is advisable that a portion of the period of study should be spent on the Continent, because a varied experience is of itself educative: and it is necessary, if you wish to make the acquaintance of certain diseases which have been either banished from this country, or not yet allowed to enter it, but for which veterinary inspectors must always be looking out. I refer to such diseases as cattle plague, pleuro-pneumonia, rabies, epizootic lymphangitis, sheep-pox, dourine, and I think even a hypercritical public might agree to foot-and-mouth disease being included in this not unimportant list. It may be asked what length of time a man should devote to this kind of training. I think the reply is, until he feels capable of catching new ideas and methods as they rise, and competent to submit them to examination, that he may not be automatically carried away by every wind that blows, however seductive. It is certain that in this country, at least, the State veterinarian will never have the good fortune of finding a clean slate upon which to commence operations. It is therefore advisable that he should also devote a considerable amount of attention to the relative importance of good science and good administrative government, and to the necessary compromises which must often be made to make his operations accord with both.

Those whose bent decides them to train seriously as scientific investigators will have elected to pursue a course of study which

is the most emancipated and attractive, but at the same time the most arduous and endless. Whatever be the subject which has stimulated you to devote yourself to it, training is to be acquired by serving periods of apprenticeship, as it were, under one or several distinguished masters. It is advisable, also, that some attention should be given to teaching as a profession, since it is included in the duties of some of the appointments you may wish to obtain.

No doubt you will ask yourselves what the material prospects are for men who have studied hard to acquire special proficiency in the various branches of the veterinary profession. I would suggest to you, in the first place, that a feeling of greater competence, if it does not arise merely from conceit, is worth something, and although competence may not always bring material rewards, it very frequently does.

General practice is the widest outlet, and will always absorb the greatest number of followers. Moreover, it is an open-air life, and it is the most lucrative branch of the veterinary profession. Nobody can shut his eyes, of course, to the fact that, in the cities at least, a great deal of horse traction has been replaced by motor-driven vehicles. In country practice, however, the horse is by no means the only animal for which the services of veterinary surgeons are required, nor does it seem to be approaching extinction. There has certainly been a falling off in the horse-breeding industry, as regards light horses at least, but, as you are no doubt aware, an organized movement supported by public funds is now on foot to encourage farmers to breed the still very indispensable commodity, the weight-carrying horse.

I am inclined to think that general practice is not nearly so depressed as some practitioners would have us believe, and I would point out that, although the Chancellor of the Exchequer has not seen his way to make concessions in relation to the tax on petrol used by practitioners for their magnificent motor-cars, he has so far refrained from threatening the profession with an Insurance Act forcing them to treat their patients for six shillings per annum, medicine included.

Those who take up veterinary State medicine must look to the departmental and municipal services for employment. I doubt if it is fully realized that there are at least twelve British Colonies and Protectorates which recruit their veterinary departments exclusively from the colleges of the United Kingdom, while there are several others in which British graduates stand a good chance of employment. Some of the former departments are certainly small, and are never likely to require more than one or two officers, but the majority are considerable, or small only because they have been very recently established. Seven have come into existence in the last six years, five of which promise considerable development. I am in a position to say that at least two important principles influenced the authorities in establishing these departments, namely, that the first thing to do before settling a colony is to settle the question of its

animal diseases, as far as possible, and that it would be unwise to send out any but the best qualified men available for this purpose. It is not in the Colonies and Protectorates alone, however, that the expert in State veterinary medicine is in request. At home we have the Veterinary Department of the Board of Agriculture, the chief duties of which are to control and investigate diseases of animals. I hope I may be excused if, for the purpose of accentuating the importance and permanence of organized departments of preventive veterinary medicine, I mention the fact that in the four last years foot-and-mouth disease has in mysterious ways been imported into Great Britain no less than six times, and that each outbreak was completely suppressed in little more than a week at a total cost of a few thousand pounds. This disease was imported five times during the nine months of the present year, and spread to four premises from the original outbreak. The importance of preventive medicine in Great Britain will be realized by consulting the latest returns from the Continent, which show that during August alone 37,737 outbreaks of foot-and-mouth disease were recorded in Germany; in July 12,385 were recorded in Holland; 4,097 in Belgium; and 16,027 in France, where it has been estimated that the loss will amount to over fifteen millions sterling.

In addition to those diseases which are already scheduled, and for dealing with which the services of specially trained veterinary surgeons are required, there are others of the first importance, notably Jöhne's disease, epizootic abortion, and tuberculosis. These only await the final ripening process of public opinion to add them to the list. They are not diseases the prevalence of which is the least likely to be influenced by ordering an extra few hundred cubic feet of air space. Progress will only be effected by reporting, followed by skilful diagnosis, and tracing up the sources of infection with the view of suppressing them, and such work can only be done well by specially trained veterinarians.

I am not going to commit the indiscretion of prediction, but I would observe that the view that the Diseases of Animals Committees of the County Councils should have at their exclusive command the advice and other services of veterinarians specially trained in State Veterinary Medicine, has so much to commend it that it is possibly not very far off consummation.

I have left the largest Department, the Army Veterinary Service, to the last, because in this case special knowledge of preventive medicine is not the sole professional recommendation. I understand, however, that special qualifications of this kind are regarded with no small favour.

In the world of veterinary investigation and research there is ample room for numerous devotees. Veterinary pathology has attracted a few men, but too few to devote their professional lives to its study. Physiological investigation has been almost severely left alone by British veterinarians. The services of veterinary helminthologists are urgently required in the interests

of agriculture, and veterinarians with special training and skill in this branch of their profession would be practically sure of employment. Of course it has to be admitted that the prolongation of the period of unremunerative work consequent upon training increases considerably the cost of education. It is difficult to believe, however, that poverty alone, on the part of parents at least, has been the cause of so few graduates training in veterinary science as distinct from practice; but I would like to draw your attention to the material assistance which the Board of Agriculture, from money allocated from the Development Fund, offer to promising graduates who desire to train seriously as investigators. Twelve scholarships of the value of £150 a year for three years will be offered in each of the years 1911, 1912, and 1913. Veterinary graduates of distinction will be eligible for such scholarships, which, it should be noted, will not be awarded to enable the recipient to work for degrees by examination, but to train as investigators. This, however, is not all; under the same scheme for the development of agricultural research and investigation funds will be available to enable certain institutions to maintain workers on specified subjects, some of which are veterinary, and, undoubtedly, there will be a more assured future than heretofore for those whose qualifications deserve recognition. There has never been a time in the history of veterinary medicine in this country when the prospects seemed so encouraging for those who elect to devote themselves seriously to preventive medicine or to research. I think I might also say that there is no branch of the profession you have chosen which is in the least overcrowded. Small as our numbers are, however, I feel sure that as a profession we will do our best to play up to what new opportunities have been given us, and to make our response a good argument upon which to base demands for more.

To come back now to the all-important question of what you are going to do when you are qualified. May I advise you, while giving the fullest consideration to what men of knowledge and experience have to say, that the process of making up your minds should in no sense be a passive one.

THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

THE forty-eighth annual meeting of the American Veterinary Medical Association was held at Toronto on August 22, 23, 24, and 25, the place of meeting being the Convocation Hall of the University. There were present about 800 members and visitors, and the proceedings were carried through without a hitch. More than 230 new members were elected, all graduates of colleges whose educational standard is approved by the Council of the Association. Various lecture theatres of the University were placed at the disposal of the several sections, and the practical demonstrations were held in

the Clinical Department of the Ontario Veterinary College, where a large marquee had been erected to facilitate comfort in the event of extremes of weather. The chair was taken by the President (Mr. George H. Glover, of Fort Collins, Colorado), and the Convention was formally opened by the Hon. Mr. Duff, who, as the representative of the Premier of the Province of Ontario, welcomed the delegates to Canada. He spoke highly of the good work which veterinary science had done, and was doing, for Canada, a country whose prosperity depended so much upon the health of its live stock, and foretold a bright future for the Ontario Veterinary College. The latter is now affiliated with the University, and a new site has recently been purchased; new buildings are about to be erected at an estimated cost of £40,000, and of this the Government has already passed a grant for half this amount, so that the work may be commenced without delay. The new Principal, Professor Grange, is already busy with the plans, and, when complete, the College promises to be one of the finest and best equipped on the American continent.

The Ontario College can claim more graduates than any other school on that side of the Atlantic, and was founded some forty years ago by the late Professor Andrew Smith, F.R.C.V.S., a graduate of the Dick College in Edinburgh. Until recently it has only had a two-years' course, but now the course is three years, and the old qualification of V.S. has been altered to B.V.Sc., with a further degree of "Doctor" after another year's study and post-graduate course.

Mr. Duff's address of welcome was followed by the presidential address of Mr. George Glover. This gentleman has made the higher education of the veterinary student his life's hobby, and his speeches throughout the meeting and social function demonstrated how earnestly he had thought out the subject.

President Glover's address was followed by a hearty address of welcome to the City of Toronto by Mr. George Geary, the Mayor, after which the more serious business of the technical papers and discussions commenced.

It is the custom each year for the Association to appoint small committees to enter into, and discuss, various problems of interest to the profession, and each committee deputes one or more of its members to read a paper or report upon the particular point in question. This is brought before the next annual meeting. For example, committees were appointed to report, amongst other things, upon "Intelligence and Education," "Diseases," "Legislation," "Publication," "Tuberculosis Commission," "Resolutions to be sent to various authorities," &c., and by way of illustrating what was done, the report, for example, of the committee on intelligence and education evolved three papers—one by Dr. C. H. Starge on "Some Educational Problems," a second by Dr. L. A. Merrillat on "Can the practitioner hope to be a successful teacher?" and a

third by Dr. Veranus A. Moore on "American Veterinary Education and its Problems."

The report of the committee on diseases brought forward five papers, as follows:—

(*a*) "The Recurrence of Dourine in the United States," by Dr. John Mohler.

(*b*) "Foot Evil in Horses and Mules; Sore Mouth in Dogs," by Dr. W. H. Dalrymple.

(*c*) "Serum Vaccine and Serum Vaccine Therapy," by Dr. A. T. Kinsley.

(*d*) "The Laboratory and the Practitioner," by Dr. Charles Higgins.

(*e*) "The Effect of Nuclein on the Blood," by Dr. B. F. Kauff.

These reports were read, but not commented upon, as discussion was not allowed on account of time.

The literary programme was divided into sections and held in different rooms at the same time, as the papers were very numerous and the discussion in some instances well sustained.

The divisions were as follows:—

Division No. 1. Pharmacy and Materia Medica, in charge of Dr. Jensen.

Papers as follows were read and discussed:—

(1) "Newer Therapeutic Agents," by Dr. P. A. Fish, of Cornell University, New York.

(2) "Biologic Therapeutics," by Dr. Dunphy, of Detroit.

(3) "Pharmaceutical Items of Interest to Veterinarians," by Dr. Ferd Mueller, of Indianapolis.

(4) "Practical Therapeutics," by Dr. Quitman, Chicago.

(5) "Selective Vasoconstrictors and Vasodilators," by Dr. Jensen, Kansas City.

Division No. 2. Surgery, in charge of Dr. A. L. Merrillat.

(1) "Observations on the Merits and Practicability of Resection of the Perforans Tendon for Open Navicula Bursæ; and Bayer's Operation for Quittor," by George Bern, D.V.S., New York. Discussion opened by Joseph Hughes, M.R.C.V.S., Chicago.

(2) "The Merits of Williams's Operation for Roaring," by Frederick Hobday, F.R.C.V.S., London, Eng. Discussion opened by W. L. Williams, D.V.S., Ithaca, New York.

(3) "Poll Evil," by R. C. Moore, D.V.S., Kansas City. Discussion opened by L. A. Merrillat, V.S., Chicago.

(4) "Observations on the Bacterin Treatment of Suppurative Processes," by Chas. H. Jewell, D.V.M., Fort Riley, Kansas. Discussion opened by A. T. Kinsley, D.V.S., Kansas City.

(5) "My Experience of Ovariotomy in Mares," by H. Fulstow, V.S., Norwalk, Ohio. Discussion opened by J. H. McNeil, V.M.D., Columbus, Ohio.

(6) "Stringhalt, with Special Reference to its Surgical Treatment," by C. C. Lyford, D.V.S., Minneapolis. Discussion opened by J. H. Blattenberg, V.S., Lima, Ohio.

Division No. 3. Practice, in charge of Dr. George H. Roberts.

(1) "The Cause and Treatment of Pulmonary Emphysema," by Dr. W. G. Hollingworth, Utica, New York.

(2) "Hog Cholera Serum," by Dr. F. A. Bolser, New Castle, Indianapolis.

(3) "Gastro-Intestinal Catarrh," by Dr. D. H. Udall, Ithaca, New York.

(4) "Traumatic Pericarditis," by Dr. George H. Roberts.

(5) "Strangles," by Dr. John Devine, Goshen, New York.

(6) "The Treatment of Pneumonia and Pleurisy," by Dr. H. Preston Hoskins, Philadelphia, Pennsylvania.

(7) "Azoturia," by Dr. S. Brenton, Detroit, Michigan.

Division No. 4. Pathology and Bacteriology, in charge of Dr. John R. Mohler.

(1) "Observations on the Pathology of Roup and Epithelioma Contagiosum," by Drs. C. M. Haring and C. A. Kofoid.

(2) "The Pathology of Nephritic Affections in Domesticated Animals," by Karl F. Meyer, Philadelphia, Pennsylvania.

(3) "An Undescribed Pathogenic Bacterium in Milk," by Dr. E. C. Schroeder and W. E. Cotton, Bureau Experiment Station, Department of Agriculture.

(4) "Immune Bodies and Biological Reactions," by Dr. Adolph Eichorn, Pathological Division, B.A.I., Department of Agriculture.

(5) "Preventive Treatment of Rabies in Animals," by John Reichel, Glenolden, Pennsylvania.

(6) "The Etiology of Infectious Abortion in Live Stock," by Professor E. S. Good, Kentucky Agricultural Experiment Station, Lexington, Kentucky.

(7) "The Results obtained in the Eradication of Tuberculosis from a Herd by the use of Tuberculosis Vaccine and the Bang System," by S. H. Gilliland, V.M.D., M.D., Marietta, Pennsylvania.

Division No. 5. Veterinary Sanitary Police Measures, in charge of Dr. J. G. Rutherford.

Papers by the following:—

(1) "Some of the Features of Sanitary Police Work as applied in the Federal Quarantine Service," by Dr. R. G. Hickman, Washington, D.C.

(2) "The Tuberculin Testing of Cattle," by Dr. Paul Fischer, Columbus, Ohio.

(3) "Anthrax and Tick Fever," by Dr. W. H. Dalrymple, Baton Rouge, Louisiana.

Division No. 6. Meat and Milk Hygiene, in charge of Dr. Louis A. Klein.

(1) "Municipal Meat Inspection of Paris, Texas," by Dr. F. G. Cook, City Meat and Milk Inspector, Paris, Texas.

(2) "State Dairy Inspection," by Dr. M. E. Knowles, State Veterinarian of Montana, Helena, Montana.

(3) "Dairy Farm Inspection in Pennsylvania," by Wm. S. Gimper, Philadelphia, Pennsylvania.

The Clinical Demonstrations.

The practical part of the programme was reserved until the 25th, and lasted all day, being well attended by a large crowd of members. A tent had been erected on a spare plot of ground adjoining the operating-rooms of the Ontario Veterinary College, and, in addition to this, the College operating tables were put into use indoors. Between fifteen and twenty patients were operated upon by experts who had made the particular operation in question a speciality. In the horse a method of washing out the stomach was demonstrated by Drs. Blattenberg and Merrillat, and these gentlemen also illustrated certain methods of suturing wounds, &c.; a case of poll evil was operated upon by Drs. Moore and Kelly; Dr. Klotz operated upon a cryptorchid; Dr. White, of Chicago, performed ovaro-hysterectomy of the bitch; Dr. White, of Nashville, Tennessee, showed numerous and ingenious methods of tying and securing animals for facilitating various operations; and Mr. Hobday operated on three roarers, a bulldog with prolapse of the mucous membrane of the penis, a bull bitch with ulcerative granuloma of the vagina, and a cat with a cyst of the ear.

Social Events.

There was really very little time for festivities, as several of the discussions were resumed in the evening, but a moonlight excursion by steamer on Lake Ontario was participated in on Wednesday evening, at the invitation of the city authorities, and on the Thursday a special invitation was extended to the ladies of the party for a drive around the city and a garden party at Sir Henry Pellatt's, whose magnificently equipped stables and horses were inspected.

On Thursday evening (the 24th) the annual banquet was held, under the guidance of Dr. J. G. Rutherford, whose general popularity and ready wit made him a most admirable chairman and toastmaster. The guests included several of the notable men of the City of Toronto, and the toasts, after those of "The King" and "The President of the United States" had been honoured, included "The Veterinary Sanitary Service," responded to by Dr. A. D. Melvin; "Veterinary Education in the States and Canada," responded to by Drs. Glover and Grange respectively; "The Royal College of Veterinary Surgeons," responded to by Professor Hobday; "The Live Stock Industry of Canada," responded to by Dr. Creelman; "The Practitioner," by Dr. Torrance; "Contributors to Veterinary Science," by Dr. Horace Hoskins; and "The Press," by Dr. Ellis.

Altogether the meeting was a great success, and a great deal of good was done towards furthering the forward progress of the profession. Afterwards the members split up into small parties—some to visit the Thousand Isles, a most beautiful

river trip up the St. Lawrence, with magnificent scenery; some to visit Niagara Falls, and others to take a further trip to one or other of the interesting places of which there is such a plentiful selection both in Canada and the United States.

Translations.

THE SUBCUTANEOUS INJECTION OF OIL OF TURPENTINE AND ITS EMPLOYMENT AS A REVULSIVE.

By Professor FRICK

(From the Surgical Clinique of the Veterinary High School at Hanover).

Professor Frick has found injections of oil of turpentine very practical and effective when injected at the shoulder, elbow-joint, hip and knee-joint, and has employed it as a revulsive for five to six years.

He uses the officinal oil of turpentine without any special preparation, and injects it with a Pravat's syringe at the shoulder, hip or knee-joint. It is best to use a thin needle, because, if some turpentine runs out on to the skin from the puncture wound, it irritates the skin and causes the horse to become restless. The skin at the puncture places is first disinfected with tincture of iodine. A large quantity of the drug is not injected at one place, but 1 grm. at each of four or five places round the joint. After twenty-four hours circumscribed painful swellings occur, which, in the course of the next day, become confluent with each other. In a further ten to fifteen days the diffuse swelling declines, and round, fluctuating places as large as one's fist are present, which many times communicate with each other. These so-called aseptic abscesses, if no mechanical insults occur to them, become completely reabsorbed in a further fourteen days. These swellings must not be opened, but if by accident this occurs, a shiny clotted material escapes which smells of turpentine, but it is perfectly aseptic, and consists of a combination of round cells and connective tissue shreds. An opened cavity may be emptied by pressure, and, if left to itself, heals quickly in three to four days. The deep effect of these injections on the joints is a very severe one, and lamenesses which have resisted all other methods have disappeared after this one, and I can recommend it as very practical.

(*Deutsche Tierärzt. Wochenschrift.*)

FILARIASIS OF THE FLEXOR TENDONS.

By PAUL DUDZUS.

One of the most remarkable happenings is the occurrence of worms inside tendons which by their presence cause specific inflammation. In horses, asses and mules a round worm, *Filaria reticulata*, occurs in the flexor tendons and ligaments of the

neck, especially in Italy, Russia and France. In Germany this parasite is seldom noticed, but it occurs in the tendons, in the connective tissue and the winding blood-vessels of the extremities, and in these positions often in the form of nests or balls without causing injury. In individual cases, however, it may lead to considerable anatomical disturbance in the tissues affected, the formation of nodular inflammatory spots in the flexor tendons, fibrous swelling in the connective tissue of the metacarpus and in the vessel walls, and to incurable lameness. Since the discovery of these parasites in the year 1838, by the English veterinary surgeon Ferguson, numerous reports have been published concerning them. Only broken pieces of the worm have hitherto been obtained. It has never been recovered in its entirety and full length. The author made examinations on two sets of flexor tendons from a 13-year-old horse, which came from Russia and was slaughtered, and in which he found the parasites. Both flexor tendons were double their normal thickness, hard, warm and sensitive to pressure. The animal showed a stretched gait on both fore-limbs without being actually lame. When cut lengthways a number of long elliptical spots were found in the tissue of the tendons and in the tissue bundles, and these cavities contained worms rolled spirally. The geographical distribution of the disease is noteworthy, also that it is only occasional to find a case in Germany. Treatment can only be symptomatic. The method of wandering of the parasite is unknown, and on prophylactic treatment nothing definite can be said.

(*Monatshefte für die praktische Tierheilkunde.*)

Letters and Communications, &c.

Professor Craig; Dr. Stapley; Mr. S. Stockman; Professor O'Connor; Mr. E. Wallis Hoare; Mr. A. W. Noël Pillers; Mr. C. W. Townsend; Capt. A. J. Williams; Dr. Rutherford; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland.

Books and Periodicals, &c., Received.

Veterinary Bacteriology, by Robt. E. Buchanan, Ph.D. (pp. 516, with 214 illustrations, 13s. net.), published by W. B. Saunders' Company, London; Lameness in Horses: Its Detection, Cause and Treatment, by A. C. Piesse, M.R.C.V.S. (pp. 82, profusely illustrated, 3s. net), published by The Cable Printing and Publishing Co., London; Bulletin of the Bureau of Sleeping Sickness; Agricultural Journal for the Union of South Africa; Rhodesian Agricultural Journal; Report of the Director of the Department of Agriculture for Canada.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière. London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.